Abstract

Numerous health behavior theories and models address human and environmental factors that affect health status. Although ecological models have called for multilevel intervention strategies, all too often health professionals remain unsure which levels of intervention to target: individual, institutional/organizational, community, public-policy or some combination of these. The decision is often influenced by general societal perceptions of how much control individuals have over health risks. These perceptions, in turn, influence health professionals’ own perceptions. The question raised here is how do these perceptions of how public or private a health issue is affect the intervention levels we target? Frequently intervention levels are discussed as if they exist on a continuum, with private individual interventions at one end, and societal policies and laws at the other. This article offers a ‘public/private health matrix’ based on two axes, one representing individual rejectability of health risks, the other showing how publicly or privately supplied or regulated these risks are. The 10 leading causes of death and two childhood illnesses in the US are used to demonstrate how the matrix might help analyze the public/private nature of different health risks and risk-reducing strategies, and to demonstrate how such distinctions may influence the levels of intervention health professionals target.

Introduction

One overarching responsibility of health educators is to develop well-designed, focused health interventions to reduce the incidence, prevalence and severity of disease, injury and sickness (National Task Force for the Preparation and Practice of Health Educators, 1985). However, knowing the pathological causes of a disease or disability is not enough to ensure that an intervention will effectively change health behaviors. Designing effective interventions requires health professionals to answer the question: when should interventions be targeted at the individual level, the institutional/organizational level, the community level or the societal level? How we answer this question often depends on assumptions by both professionals and the public as to whether particular health risks and risk-reducing strategies are of public or private concern.

This article offers a public/private health matrix in hope of encouraging health professionals to analyze more carefully our own and others’ perceptions of health risks, and how these perceptions influence the levels of intervention we target. A broad range of health risks is addressed. Each of the health risks is placed in a numbered box within the matrix based on general historical perceptions of how publicly or privately supplied or regulated and how individually rejectable the risk is. Each risk then is analyzed according to how perceptions may change with different populations, settings and risk-reducing strategies. Finally, several suggestions are offered about how these changes in perception may influence targeted interventions for each of the risks and risk-reducing strategies.
Although this article may raise more questions than it answers, it is hoped that it will stimulate discussion and research into how and why we, as health professionals, target different levels of interventions for different health risks.

**Historical perspective**

When national disease-prevention and health-promotion objectives were first published in *Healthy People 2000*, the objectives targeted all levels of intervention: individual, organizational, communal and societal (US Surgeon General, 1980; Public Health Service, 1991). However, some early health promotion models primarily emphasized lifestyle changes and individual responsibility for health behaviors (O'Donnell, 1986). This emphasis on the individual has been criticized as the ‘tyranny of health promotion’. By assuming that the responsibility for changing health behaviors lies solely with individuals, one may inadvertently blame the victims for health conditions over which they have little or no control (Becker, 1986).

At the other extreme is the ‘tyranny of health protection’ or the ‘paradox of prevention’ (Rose, 1981). Rose argues that by targeting community and social interventions, one may influence enough low-risk individuals’ behaviors that the overall impact will be more profound than by targeting only high-risk individuals. However, he goes on to point out that it is difficult to know who will benefit. Such interventions represent a ‘wide-brush’ approach to health promotion, with the advantage of not ‘blaming the victim’ but the disadvantage of low predictability. Such interventions may result in more costly expenditures (in time, effort and money) for low-risk individuals with no guarantee that those individuals will benefit directly from behavioral changes.

From this debate about individual versus societal changes, various ecological models emerged attempting to address both. Although these models call for reciprocal determinism between environmental and individual factors, they have been criticized as being too complex to be readily utilized (Bronfenbener, 1977; McLeroy *et al.*, 1988; Minkler, 1989; Glanz *et al.*, 1990; McKenzie and Jurs, 1993; Robertson and Minkler, 1994).

McLeroy *et al.* (McLeroy *et al.*, 1988) provide an elaborate description of reciprocal relationships among *intrapersonal* concepts (knowledge, attitudes and values), *interpersonal* relations (within families, friendship networks and work settings) and *societal* structures (institutional/organizational and community factors and public policies). This model is distinguished by its effort both to identify ‘intervention targets’ and to encourage interventions at all levels. However, clear guidelines for how to identify appropriate interventions, or combinations of intervention levels, are not provided (McLeroy *et al.*, 1988).

The Precede–Proceed Model (Green and Kreuter, 1991; Green *et al.*, 1994, 1996) endeavors to clarify levels of intervention by providing systematic diagnostic steps that include environmental as well as behavioral considerations. However, years of extensive use have shown that the model tends to produce individual-oriented interventions rather than interventions at multiple levels (Fulmer *et al.*, 1992).

PRECEDE served PATCH [Planned Approach To Community Health] communities well as a diagnostic planning tool, but by itself, it may lead to misplaced precision on the things easiest to measure or analyze. The addition of policy, regulatory, and organizational dimensions of educational and environmental development in the communities will offer more robust programs with greater potential to change community culture and structures that conspire against healthful living [(Green and Kreuter, 1992) p. 143].

The question remains: how can we encourage and facilitate multiple levels of intervention? Daniel Stokols (Stokols, 1996) recently attempted to answer this question by suggesting the use of six ecological guidelines. However, he offers few explicit descriptions of how to use these guidelines to assure multiple levels of intervention. The public/private health matrix presented here attempts to answer the question by combining aspects of
ecological and economic models that encourage health professionals to analyze the public or private perceptions of health risks.

**Background: public/private goods**

Classical economists describe goods and services as being distributed via the market. If there is enough demand for a product or service, it will be produced at a price that enough people are willing to pay to make it profitable for the provider. This relationship works better with *private* goods than with *public* goods (Barry and Hardin, 1982; Hardin, 1982). According to economists, private goods are characterized by two dimensions—*private, separate supply* and *rejectable individual consumption* (Barry and Hardin, 1982). Private, separate supply means one person’s preference for white bread does not prevent another person from choosing brown bread. The supply of each is separate; one person’s choice is not dependent on another’s except that a sufficient number of people must be able and willing to pay a high enough price for that type of bread to make it profitable to produce. With private goods, consumers also can reject a product and substitute others based on the quality or price of a good, e.g., if one finds that bread becomes moldy in a few days, one may decide to substitute rice for bread in the diet. (Note that economists often fail to acknowledge the fact that food purchasers are not necessarily the same as consumers.) In other words, the purest of private goods are defined in terms of individual preferences and individuals’ choices.

Public goods are defined in terms of *communal supply* and *non-rejectable consumption* (Barry and Hardin, 1982). Communal supply means that one person’s supply is everyone else’s supply. For example, economists speak of air as the most public of all goods. With the purest of public goods, it is impossible for anyone to reject the good. If the product is damaged or undesirable for any reason, one still must consume it. For example, if one must drive on a highway or live in a home next to factories that spew foul-smelling chemicals into the air, one cannot avoid the stench by refusing to breathe nor can one substitute another product for air (Olson, 1965; Beauchamp, 1984; Kuttner, 1996). The purest of public goods are defined in terms of universal supply; individuals’ preferences cannot be exercised without influencing others’ supply.

**Public/private health matrix**

In the same way that economic ‘goods’ can be private or public, so can health risks and their corresponding risk-reducing strategies. One’s perceptions of health risks may be very different than one’s perceptions of strategies to reduce those risks. According to Guttman (Guttman, 1996), it is not sufficient simply to analyze the causes of health risks. One must also analyze how risk-reducing tools or intervention strategies are perceived by different populations in different settings. With this in mind, the matrix is used here to discuss both health risks and risk-reducing strategies.

The two axes of the matrix depict: (1) the degree to which health concerns are perceived as individually rejectable [what Minkler describes as individual ‘response-ability’ (Minkler, 1989)] and (2) the degree to which health concerns are perceived as publicly or privately supplied or regulated. Using a matrix rather than a simple continuum allows for the discussion of paradoxical health risks; those that are privately supplied and at the same time not rejectable, and those that are publicly supplied but are individually rejectable.

To demonstrate how the matrix works, the 10 leading causes of death in the US—heart disease, cancer, stroke, injuries, influenza/pneumonia, diabetes, cirrhosis, suicide, homicide and AIDS—are used, along with two leading causes of childhood illness—lead poisoning and childhood asthma. Table I outlines selected risk factors for each cause of death and childhood illness as well as selected risk-reducing strategies associated with each. Figure 1 demonstrates the use of the matrix by placing each health risk in a numbered box based on historical perceptions of the public/private nature of these health risks. However, examples are given throughout the paper as to how changes in popula-
Table I. Risk factors and risk-reducing strategies for the 10 leading causes of death in the US and two causes of childhood diseases

<table>
<thead>
<tr>
<th>Leading causes of death and disease</th>
<th>← Risk factors</th>
<th>← Risk-reducing tools or strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart disease</td>
<td>High blood cholesterol</td>
<td>Low-fat, low-cholesterol, low-salt diet</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Obesity</td>
<td>Exercise</td>
</tr>
<tr>
<td>Stroke</td>
<td>High blood pressure</td>
<td>Antismoking measures</td>
</tr>
<tr>
<td>Cancers</td>
<td>Smoking</td>
<td>Anti-radiation measures</td>
</tr>
<tr>
<td>AIDS</td>
<td>Unprotected sexual intercourse</td>
<td>Condom usage</td>
</tr>
<tr>
<td></td>
<td>Sharing IV drug ‘works’</td>
<td>Clean IV needles</td>
</tr>
<tr>
<td>Injuries</td>
<td>Home hazards</td>
<td>Children’s window guards</td>
</tr>
<tr>
<td></td>
<td>Motor vehicle accidents</td>
<td>Motorcycle helmets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seat belts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roadway safety design</td>
</tr>
<tr>
<td>Influenza</td>
<td>Infectious microorganisms</td>
<td>Hygienic measures</td>
</tr>
<tr>
<td>Pneumonia</td>
<td></td>
<td>Immunizations</td>
</tr>
<tr>
<td>Homicide</td>
<td>Handguns</td>
<td>Handgun safety measures</td>
</tr>
<tr>
<td>Suicide</td>
<td>Substance abuse</td>
<td>Drug regulations</td>
</tr>
<tr>
<td>Cirrhosis of the liver</td>
<td>Alcohol abuse</td>
<td>Substance guidelines and control</td>
</tr>
<tr>
<td>Childhood lead poisoning</td>
<td>Lead-based paint dust</td>
<td>Lead control measures</td>
</tr>
<tr>
<td></td>
<td>Lead-based water pipes</td>
<td></td>
</tr>
<tr>
<td>Childhood asthma</td>
<td>Air contaminants including tobacco smoke</td>
<td>Anti-pollution measures</td>
</tr>
</tbody>
</table>

Source: adapted from Table 3.8 in Green et al. (1995).

tion and setting may modify perceptions of the public/private nature of health risks and risk-reducing strategies. Such changes may move a risk from one box in the matrix to another and may modify the levels of intervention targeted.

Using the matrix

Purest private health risks

Among the ‘purest’ private health risks contributing to the 10 leading causes of death in the US are *individual* alcohol abuse, *individual* smoking habits and *adult* handgun hazards (Figure 1, box 1). In private settings, smoking, drinking and handgun use are primarily of concern to the individual user. It should be apparent that alcohol, tobacco and handguns are purchased by adult individuals, with the capacity to choose whether or not to change these practices, and that their purchases do not affect the purchase choices of others. In other settings, however, all three of these risks become significantly more public, affecting more than just the purchaser. (See discussion below under Mixed public/private risk factors and Health risk paradox 2.)

Unprotected sexual intercourse (USI) is categorized as relatively highly rejectable but mixed in terms of public/private supply (Figure 1, box 2). Sexual intercourse usually takes place in private settings. The fact that one couple chooses oral contraceptives (or none at all) does not prevent another from using condoms. However, USI is classified as mixed in supply because in the case of rape, sexual harassment or the presence of strong peer pressure, individuals may be forced to have sex without contraceptives (Abma et al., 1998).

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High cholesterol, high blood pressure and obesity also are relatively rejectable. People are not forced by society to eat salty, fatty, high-calorie food. If someone wants to eat high-cholesterol bacon cheeseburgers all day, every day, others can still eat broccoli, fruit and tofu. Although these factors are largely privately supplied (i.e. determined by individual behaviors), they may be influenced by genetic predisposition and financially limited dietary choices, making them only moderately rejectable (Figure 1, box 2).

**Purest public health risks**
At the opposite corner of the matrix are the ‘purest’ public health risks associated with cancers, injuries, and influenza (Figure 1, box 3). Air and water contaminants, infectious microorganisms, outdoor radiation sources and motor vehicle accidents are examples of health risks individuals cannot reduce simply by their own choices.

**Mixed public/private risk factors**
In the center of the matrix are health risks that can be perceived as private in one setting and public in another. This is the case for tobacco smoking and alcohol abuse (Figure 1, box 4). Not long ago, tobacco smoking was considered a private, personal choice—a lifestyle (Figure 1, box 1). However, as awareness of the hazards of second-hand smoke has grown, smoking increasingly has been perceived as
a public risk when it occurs in public settings (Perry et al., 1992; MacKenzie et al., 1994; Green et al., 1995).

The perception of alcohol consumption also has changed historically. It was perceived first as a public, later as a private and then again as a public health risk, depending on the population and the setting. During Prohibition, alcohol consumption was considered a public issue, with public drunkenness the primary concern. However, since alcohol is often consumed privately, with a high degree of rejectability, efforts to criminalize alcohol consumption were largely unsuccessful. After Prohibition was repealed, alcohol consumption was again perceived largely as a private, personal lifestyle choice. However, this perspective changes when people drink and drive on public roads, putting others’ health and safety at risk (Robertson, 1996).

Up to this point, the discussion has centered on health risks that lend themselves to a relatively intuitive understanding of their public/private nature and the effects of changes in setting and population (Figure 1, boxes 1–4). The health risks in boxes 5 and 6 of the matrix, however, involve more complex combinations of risks and intervention strategies.

**Health risk paradox 1: public supply, with high private rejectability**

Intravenous (IV) drug use, child window falls, auto-safety design and motorcycle hazards (Figure 1, box 5) all represent a departure from the usual linear assumption that publicly supplied and regulated health risks are associated with low levels of private rejectability. Instead, these health risks and their related risk-reducing strategies are to a large extent publicly supplied or regulated but still retain considerable individual rejectability.

Although IV drug use usually occurs in private settings, it is currently regarded in the US as alcohol was under Prohibition—as a public health risk requiring public restrictions. This situation, however, becomes problematic when public regulations are used to restrict the sale of IV syringes. Although health professionals can try to convince IV drug users not to share syringes and to clean their needles with bleach, they often are legally prohibited from providing clean needles. Research into the effect of needle-exchange programs on HIV transmission strongly suggests that providing clean IV needles for known drug addicts can greatly reduce transmission rates (Daniels et al., 1991; Burris et al., 1996; Glantz and Mariner, 1996). In other words, the public intervention strategy (restricting the supply of clean needles) that is designed to protect the public safety may be endangering individuals’ health as well as public safety from HIV/AIDS. This suggests that the public restriction of needles may need to be altered to allow greater individual supply of clean needles to those at greatest risk. This would move IV drug risk and syringe regulations from box 5 to box 4, with moderate rejectability and mixed supply.

Childhood window falls are an example of a health risk for which public interventions have also in part relied on individual respondability. The risk of children falling out of high-rise apartment windows is of particular concern in urban settings, where many apartments are private rental units with private building owners responsible for maintenance. The safety of children living in these apartments for years was largely seen as the individual renter’s ‘response-ability’. It was their job to supervise and educate their children about window safety. In the 1970s, however, an innovative educational pilot program to reduce window falls altered that perspective by including publicly supplied low-cost window guards and installation instructions to some low-income residents in New York City. It successfully reduced the incidence of child window falls by 35% from 1973 to 1975. These results altered the perception of window falls from a solely private health risk to a public health risk. In 1976, new amendments to the city’s health code were passed mandating landlords to provide window guards in all apartments with young children (Spiegel and Lindaman, 1977). From 1976 to 1995, the total number of falls decreased by 79% and the number of falls that could have been prevented by window guards decreased by 83% (New York City Department of...
Health, 1996). This example demonstrates that while individual interventions can be relatively successful with health risks that are perceived as private and individually rejectable, changing perceptions and public community interventions may lead to an even greater reduction of risk.

Seat belts provide another example of how public health protection has augmented the success of individual health promotion. Although the risk of motor vehicle accidents (Figure 1, box 3) has been dramatically reduced through public highway regulations, seat belts were first perceived as very much a private issue. When seat belts first became available, they were offered to consumers as a private safety option purchased at an additional cost. In 1966, Congress passed the Highway Safety Act, mandating seat belts as a standard safety feature on all new cars. With the addition of mandatory seat-belt use laws in most states between 1985 and 1990, such use more than doubled, reducing the number of highway deaths and the severity of motor vehicle injuries (Escobedo et al., 1974, 1992; Datta and Gutzek, 1990; Latimer, 1992; Robertson, 1996). By first publicly supplying the risk-reducing tool (seat belts) in all vehicles before targeting individuals’ use through educational campaigns, the health risk was greatly reduced. A single strategy, based only on private supply—convincing people to buy and use seat belts—would probably have been far more difficult and less successful.

The case of motorcycle helmets, however, demonstrates another side of this paradox. Since the 1970s, motorcycle helmet use has been perceived as a private, then a public and again a private health issue. By 1984, in response to a rising number of motorcycle-accident deaths and injuries, 49 states adopted mandatory helmet laws. Unhelmeted cyclists were said to pose a potential financial burden on others because unprotected cyclists who suffered head traumas often became wards of the state (Beauchamp, 1984). However, this argument was not well accepted by the general public or by motorcyclists, and since the 1980s, helmet laws have been weakened or repealed in half the states, leading to a 60% increase in motorcycle fatalities. Currently only 25 states have all-rider helmet laws. In these states, usage rates are close to 100%, compared to 36% in states without such laws (Watson et al., 1980; Hartunian et al., 1983; Rivara et al., 1988; National Highway Traffic Safety Administration, 1990; Sosin et al., 1990; Kraus et al., 1994; Stone, 1995). In this case, individuals’ perceptions of helmet wearing as a private choice has won out so far over public health protection. Unless the overall perception of the public health benefits of helmets becomes more accepted, publicly mandated helmet use is unlikely to be very successful. Therefore, motorcycle hazards fit better into box 2 of the matrix, with private supply and high to moderate rejectability.

**Health risk paradox 2: private supply with low private rejectability**

In the lower left corner of the matrix are those health risks and risk-reducing strategies that are privately supplied but have low rejectability (Figure 1, box 6). Many of these health hazards occur within private homes. The general public is not at risk, but individuals still may not be able to act on their own and their continued risk may have negative societal health costs. These risks include handgun hazards for children, air contaminants due to ‘sick-building syndrome’, residential radon, residential lead-poisoning and residential asthma hazards.

Handgun risks are different for children and bystanders than for adult handgun owners. Children and bystanders who are endangered by handguns have little choice in the matter. They do not purchase firearms and cannot know if firearms pose an immediate risk, making rejectability low. Although this perception of public handgun risks has been slow to develop in the US, it is increasingly becoming more widely accepted (Webster, 1993). In 1993, Congress passed the Brady Bill, placing restrictions on firearm purchases. After its passage, from March, 1994, to January, 1995, gun applications were denied to more than 15 500 persons, including more than 5500 convicted felons, fugitives and drug dealers (Bureau of Alcohol, Tobacco and Firearms, 1995). Such changes
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mean handgun hazards for children and bystanders in the matrix may eventually move from box 6 into box 4, with mixed supply and rejectability.

Similarly, individuals working in private buildings where windows do not open may be subjected to air contaminants. These individuals cannot improve air quality on their own, and are forced either to quit their jobs, complain to management and/or organize others to jointly complain, risking reprisals. A potential public intervention might be for municipalities to prohibit the construction of buildings with windows that cannot be opened. This suggests that the health risk due to 'sick-building syndrome' could be moved from box 6 into box 4, with mixed supply and rejectability.

One in 15 homes in the US is estimated to have elevated levels of indoor radon. Since this is an environmental problem, it might be perceived as a public health risk. However, radon is only hazardous when trapped in enclosed spaces where people spend an extended period of time. Thus, the health concern shifts to a private setting—the home. Currently, the Environmental Protection Agency (EPA) recommends privately supplied, voluntary ‘passive radon control systems’ in new homes in high-risk radon zones and voluntary testing of homes at the time of resale (EPA, 1993). However, increasing the perception of radon as a public health issue might allow for such public interventions as mandatory-detection regulations aimed at improving homeowners’ knowledge and their ability to reduce the risk of lung cancer. Some public subsidies to finance radon remediation might further reduce this risk. Such a change would move radon remission from box 6 to box 4, with mixed supply and rejectability.

Although public laws removing lead-based paints from store shelves and lead from gasoline have already reduced the dangers of lead poisoning, risks remain from paint dust and water pipes in older residential dwellings and in surrounding contaminated soil. Most current lead-poisoning interventions target individual case identification, education and remediation with little discussion of public-health prevention measures (Alliance to End Childhood Lead Poisoning, 1991; Centers for Disease Control and Prevention, 1991; Miller, 1995). The situation resembles that of window guards or seat belts. Since residential lead-based paint and lead pipes may not be financially rejectable by individual homeowners and apartment dwellers, public regulation of resources may need to be in place before behavioral change can be targeted. Children’s advocates might follow the example of New York City’s window-guard regulations, establishing remediation measures for landlords. This would be particularly effective for inner-city children whose families rent their dwellings and therefore cannot choose to make the necessary renovations. The new 1997 Federal lead regulations are moving in this direction (United Parents Against Lead, 1994; Cohn, 1995). In such a case, lead-poisoning hazards would move from box 6 into box 4, with mixed supply and rejectability.

Another area where public-policy interventions might greatly reduce the incidence of disease is in asthma-prevention programs for children. Currently, most asthma programs target medical management and individual self-medication, but rarely address environmental triggers such as smoking among family members (Hindi-Alexander and Cropp, 1981; Green and Frankish, 1994). The question is similar to gun safety for children: when are public interventions in private settings necessary to protect individuals who cannot reject a health hazard? In other words, at what point does smoking in the home become so hazardous to a child’s health that it might be considered a form of child abuse? Such perceptions would move asthma hazards also toward box 4, with mixed supply and rejectability.

**Implications for intervention strategies**

The above discussion outlines how the matrix can be used to analyze public/private perceptions of health risks. We have already discussed some risk-reducing intervention strategies that correspond to the paradoxical health risks in boxes 5 and 6. The
following section outlines strategies for health risk factors in boxes 1–4.

The interventions for the health risks in boxes 1 and 2 are perceived largely as private and rejectable. The matrix suggests that health risks in this section are dominated by individuals’ perceptions. This suggests that we use individual interventions that target persons at greatest risk, such as Alcoholics Anonymous programs for alcohol abuse, smoke-stoppers for individual smoking habits, gun-safety education for adult handgun hazards, condom demonstrations for sexually active individuals, and diet education/exercise programs for individuals with high blood pressure, high cholesterol and/or obesity risks.

This is not to say that individual-level interventions should be the only target. Rose (Rose, 1981, 1985) and Glanz et al. (Glanz et al., 1995) argue that to change certain behaviors related to heart disease we need more ‘mass’ educational approaches. Clearly family, cultural and institutional factors influence the availability of healthful food and opportunity to exercise. Such factors also encourage or discourage tobacco smoking, unprotected sexual intercourse, unsafe gun use and heavy drinking. For example, Chaloupka and Wechsler (Chaloupka and Wechsler, 1996) demonstrated that mass health education campaigns at the community level in conjunction with individual behavioral interventions can support voluntary changes in binge-drinking. However, mass campaigns alone have largely been inconclusive in showing changes in individuals’ behaviors when perceived rejectability is high and supply is private. For example, the new standardized, easier-to-understand food labels are supposed to aid individuals in making healthier food choices, but this has not yet been shown to lead to reduced cholesterol, sodium or calorie consumption.

The health risks in box 3 of the matrix, those perceived as most public, traditionally have been addressed through public interventions such as industrial-radiation controls, air-emission regulations and highway regulations. Even here, however, health professionals have used interventions that require some individual decision making, i.e. individual vaccinations and public regulations of food-handlers.

In the case of influenza and pneumonia immunization, vaccines have been publicly supplied to assure that a sufficient percentage (close to 60%) of at-risk populations is immunized (Centers for Disease Control and Prevention, 1996). While vaccines are often publicly provided so as not to leave the supply dependent on individuals’ purchasing powers, there remains a degree to which private personal choice is involved in the decision to be immunized. Therefore, individual educational campaigns have been used for the elderly, the chronically ill and others at risk, as well as for physicians who administer vaccines. Although immunizations address the highly public health risk of infectious microorganisms (box 3), the immunizations themselves may more accurately lie in box 5 of the matrix, where the supply is public but considerable individual choice can be exercised.

Hygiene of restaurant food-handlers is another example of a situation where population and setting change the perception of the intervention needed. Microorganisms on one’s hands generally infect only oneself and one’s immediate family. However, when those microorganisms can infect members of the general public, personal hygiene becomes a public concern. For restaurant patrons, rejectability is low, since they cannot see microorganisms on employees’ hands and choose to eat elsewhere. Therefore, restaurant hygiene has been publicly regulated for years with ordinances that require all employees to wash hands before leaving the restroom. However, restaurant employees’ rejectability of these ordinances is still high, since direct observation of all employees’ hygiene is next to impossible. Again, the public health risk of infectious microorganisms in box 3 of the matrix requires an intervention (individual employee education) that falls into box 5.

The mixed health risks in box 4 of the matrix require flexible targeting of interventions depending on the population and setting. As the perception of second-hand smoking has changed, increasing public antismoking ordinances have
been passed and successfully enforced. The same
is true for highway hazards resulting from alcohol
abuse. Since people using public roads cannot
know the level of intoxication of other drivers
and choose alternative routes, public regulation of
drinking and driving has been accepted by the
general public, although enforcement remains
imperfect.

Conclusion

The above discussion of the public/private health
matrix demonstrates the numerous complicated
circumstances that can influence perceptions of
health risks. Careful consideration of these circum-
cstances very often led to placing the health risks
in the middle of the matrix, in box 2 or box 4.
This demonstrates the importance of the multilevel
intervention strategies called for so strongly by
ecological models. Health risks that are purely
privately supplied and highly rejectable are rela-
tively rare. (Dental caries may be an example, but
they are not among the leading health risks in the
US.) Even issues of individual diet and exercise
are influenced by economic access, availability,
institutional support, etc. Strategies to reduce the
risk of private home-health hazards often remain
beyond a resident’s control and require more public
interventions.

On the other hand, health risks with extremely
low individual rejectability that are publicly regu-
lated (i.e. infectious microorganisms) may require
risk-reducing strategies (i.e. immunization) that
necessitate some individual interventions. In fact,
we have seen with the example of IV drugs that
using only public interventions (i.e. syringe-sale
restrictions) can result in increased rather than
decreased public risks. Attempts to publicly man-
date motorcycle helmet use also are unlikely to be
successful unless individual education is first used
to increase acceptance of the risks as public.

Even in the center of the matrix, the process of
combining and prioritizing intervention levels may
change dramatically for different populations and
settings. Smoking and alcohol use in public settings
are public health risks for non-users and require
different interventions than those for smoking and
drinking in private settings. Protecting children’s
health may require going beyond education for
parents, guardians and caregivers, as we have
seen with handguns, window falls and residential
asthma risks.

Although this article attempts to delve into the
complexity of the issues, it is only a beginning.
More precise research is needed on the perceptions
of rejectability and public/private supply/regulation
for various health risks and risk-reducing strategies.
Survey instruments need to be developed to mea-
sure public/private perception of specific health risks
among different populations and within different
setting. Do the people most affected regard the
problem as a matter of personal choice, right or
responsibility, or do they believe their ability to
change is limited by environmental forces beyond
their control? What are health professionals’
assumptions about individuals’ rights and respons-
ability for behavior changes, and how is that
reflected in the intervention levels we target?
By measuring these variables, we may begin to
quantify more exactly how public/private percep-
tions vary.

The challenge for health professionals is to find
the means to be sure we do not overuse regulations
and fall into the tyranny of health protection
(as in the cases of Prohibition and syringe-sale
regulation), while avoiding the tyranny of health
promotion that ‘blames the victim’ for not
changing behaviors that are profoundly socially
and institutionally determined. A balance between
public-policy strategies, organizational regulations,
community grassroots initiatives and individual
education is required. The public/private matrix
may help to provide a ballast for maintaining such
an equilibrium.

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References


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