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A Public Health Perspective on Gambling¹: *The Four Principles*

Gambling as an Emerging Public Health Issue

During much of the past several decades, I have been working to advance my understanding of addictive behaviors. The more I studied addiction, the more the task of unraveling it became complex and challenging. Addiction is a vexing, repetitive and self-destructive pattern that seems resistant to even the best conceived devices intended to stimulate change. Typically, this resistance is explained by attributing the cause of addiction to the characteristics of ingested psychoactive drugs: as if the drugs caused addiction. New research shows that addiction is not a property of a drug or chemical any more than it is a property of dice. Certainly drugs can stimulate neuroadaptation (e.g., tolerance and withdrawal) and the development of dependence; but not everyone who takes a dependence producing drug develops such dependence. Similarly, some people gamble or shop excessively and, as a consequence, biologically adapt to the experience (i.e., neuroadaptation) so that when they stop shopping or gambling they feel the discomfort of withdrawal. These observations of behavioral or “process” addiction have encouraged scientists to rethink the very nature of addiction.

For much of the history of gambling, observers considered intemperate betting to be a moral weakness (e.g., 65). Gradually, as psychological thinking advanced, people began to consider excessive gambling as a psychological problem. For the past 20 years, diagnosticians considered intemperate gambling as a repetitive behavior disorder. Most recently, neurobiological views of intemperate gambling have started to emerge. Each of these different perspectives emphasizes the individual gambler and their various bio-psycho-social attributes.

Currently the field of gambling studies is in the midst of an important paradigm shift. Clinicians, researchers and public policy-makers have started to consider gambling from a public health view. David Korn and

¹ This article is based upon a variety of recent publications that encouraged viewing gambling from a public health perspective and then started the task of developing a public health research agenda (37, 38, 72, 75, 78-80). Many colleagues stimulated and advanced my thinking about these issues and for this I owe them a great debt. Portions of this article rest upon other publications that I co-authored with David Korn, Rachel Kidman, Debi LaPlante and Richard LaBrie. For the many and varied contributions of my co-authors, I extend special thanks to them. For any errors, I accept responsibility. Christine Reilly deserves special thanks for helping me edit earlier versions of this article. In addition, I want to extend my thanks to Tony Donato, Christine Thurmond, Robert Ladouceur, Ken Winters, Alex Blaszczynski, Judy Patterson, Marvin Karlins and Reverend Thomas Grey who each stimulated and influenced my thinking on these matters.

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I were among the very first to encourage the adoption of this perspective. Approaching gambling from a public health perspective promotes the examination of health-related phenomena through a population-based lens. One benefit of this view is that it promotes consideration of health-related phenomena at a macro level that might not be available using more individually oriented research approaches. Add to this the growing interest in providing treatment resources for disordered gamblers and it is easy to see the advantages of viewing gambling from a public health perspective.

A public health perspective brings many prisms to a problem. A public health perspective encourages a multidimensional understanding of health-related issues. Consequently, adopting a public health perspective has many important implications—and some of these ramifications create problems for various gambling-related stakeholders since their position is not always easily supported. In this article, I will examine briefly four principles upon which a public health perspective on gambling rests: taken together, this doctrine challenges observers on every side of the gambling issue to carefully consider their claims and positions.

The Emergence of a Public Health Framework for Gambling

While public health perspectives were gaining strength with respect to other addictive behaviors, this viewpoint remained peculiarly absent from the contemporary dialogue on gambling-related problems. Until David Korn and I published our monograph on gambling and the health of the public (38), professionals had not applied public health strategies and perspectives to gambling related problems.

As my colleagues and I have noted in a variety of papers (35, 38, 39, 78, 79, 81), contemporary public health perspectives are not limited to the biological and behavioral dimensions related to gambling and health; a public health perspective also can address the social and economic determinants of gambling such as income, employment and poverty. A public health viewpoint can lead to the design of more comprehensive and effective strategies for preventing, minimizing, and treating gambling-related problems. In addition, a public health perspective encourages public policy-makers to distinguish acceptable from unacceptable risks. To identify these risks, a public health framework encourages an epidemiological examination of gambling and gambling-related disorders; epidemiology attempts to understand the distribution (i.e., pattern and spread) and determinants (i.e., origins) of gambling as

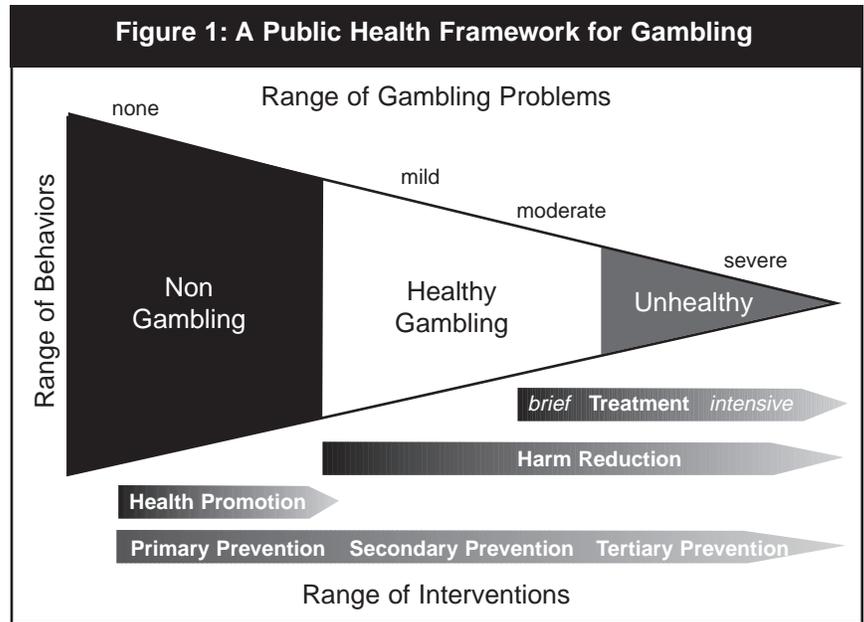
well as the factors that influence a transition from healthy to unhealthy gambling.

David Korn and I suggested that by understanding gambling and its potential impacts on the public's health, policy-makers and practitioners could minimize gambling's negative impacts and appreciate its potential benefits (38). We also suggested that a multidimensional public health framework could stimulate a better understanding of gambling, elucidate the determinants of disordered gambling and point to a range of interventions. Further, we proposed that the classic public health model for communicable disease, which examines the interaction among host, agent, environment and vector, also could be instructive for gambling.

For gambling, the “host” is the individual who chooses to gamble and who might be at risk for developing problems depending upon their neurobiology, psychology and behavior patterns. The “agent” represents the specific gambling activities in which players engage (e.g., lotteries, slot machines, casino table games, bingo, horse race betting). The “vector” can be thought of as money, credit or something else of value. The “environment” is both the microenvironment of the gambling venue, family, and local community as well as the socio-economic, cultural, social policy and political context within which gambling occurs (e.g., whether it is legal, how available it is, and whether it is socially sanctioned or promoted). Like most public health matters, there is a complex relationship among multiple determinants. This confluence can produce a variety of possible outcomes ranging from desirable to undesirable. Applied to gambling, this public health paradigm invites consideration of a broad array of prevention, harm reduction and treatment strategies directed toward various elements of the model. Figure 1 summarizes a public health perspective on gambling, its potential consequences, and opportunities for multi-level interventions.

Elements of a Public Health Perspective for Gambling

A public health perspective on gambling organizes many different models of gambling and provides some organizational framework for integrating or distinguishing these models. For example, gambling can be



viewed as game playing, moral weakness, economic risk-taking, psychological sensation seeking, an anodyne or self-medication for depression, an attempt to control fate, mathematical modeling, a biological vulnerability or a host of other things. Each micro-model of gambling and its consequences deserves consideration, though this is beyond the scope of this article: to thoughtfully accomplish this type of examination, a broader macro-model provides the vantage point (e.g., 36). A public health point of view provides just such a vantage point. However, every vantage point comes with its inherent biases. At one point in history, the earth was considered to be the center of the universe with the sun and other planets rotating around it; now the earth is but one planet rotating around the sun. However, each of these perspectives rests upon apparently similar evidence. That is, when we look to the heavens just as people did centuries ago, it appears as if the sun rotates from east to west across the sky. Only our model has changed. While a public health model of gambling focuses our gaze, it also blinds us to alternative views of gambling. This is inherent in organizing paradigms (40, 47).

The Four Principles

Four principles provide the basis for a public health perspective on gambling: (1) scientific research is the foundation of public health knowledge; (2) public health knowledge derives from population-based observations; (3) health initiatives are pro-active (e.g., health promotion and prevention are primary while treatment is secondary); and (4) public health is balanced and considers both the costs and benefits of gambling.

In the discussion that follows, I will examine each of these principles and consider the evidence that these strategies reveal. In addition, I will introduce the opposite of each principle, that is: (1) public health knowledge can emerge from junk science; (2) public health knowledge derives from isolated cases; (3) health initiatives are reactive (e.g., treatment is primary and prevention is secondary); and (4) public health is biased toward risk factors since the ends justify the investigative means.

Principle 1: Scientific Research is the Foundation of Public Health Knowledge

Science provides the vehicle for generating public health knowledge. The scientific method provides a guide for conducting research and evaluating evidence. A public health perspective requires that evidence is derived from scientific research. Currently, there is considerable debate about what research is scientific and what research is biased by beliefs

and opinions rather than the independent pursuit of knowledge. There are pro- and anti-gambling advocates, for example, and some of these advocates also present themselves as “experts” or “scientists” about gambling and gambling-related problems. However, “[R]esearchers are individual and as such may have strongly held values, but they are required to seek objectivity and awareness of the potential misuse of their work by proponents of various ideologies.... the extent to which researchers stay within their findings and strive for objectivity in their presentation is a crucial measure of ethicality.... Nowhere is this truer than when research examines controversial topics.... The conflation of advocacy and science is a clear breach of ethical principles...” (61, pp. 141-142). While public health workers examine the scientific evidence with an objective eye, advocates often use only the scientific evidence that supports their already established position. This unfortunate circumstance provides the context for the emergence of the antithesis of science, that is, pseudo or junk science.

The Opposite of Science: Pseudo-science

Historically, the powerful members of society determined public health concerns; however, more recently, various social movements have attracted attention to lifestyle patterns (e.g., drinking, gambling, eating) that can produce health problems. Fueled by personal experience, these groups have stimulated various aspects of health care reform. A grass-roots movement, for example, has helped to increase attention toward gambling and gambling-related problems. While bottom-up social movements are essential to assure that the full range of health care concerns get attention, sometimes a pound of anecdote fails to yield an ounce of proof. The result can be considerable chaos among interested parties. When this circumstance emerges, stakeholders often engage in dueling “experts” and competing “research.” In efforts that can tarnish science, these groups seek evidence that supports their position and ignore findings to the contrary. Political agendas substitute for rigorous methods and empirical analyses. Unfortunately, this kind of “ends-justify-the-means” strategy yields little more than junk or pseudo-science. “Sometimes after the smoke clears and the dueling experts have put their guns away, the most injured body left on the courtroom floor is the one called science” (21, p. E7). It can be very difficult to distinguish real science from junk science. Kaminer noted that “The combination of respect for scientific expertise, ignorance of scientific principles, and a penchant for religious faith is a perfect prescription for pseudoscience” (28, p. 163).

A public health strategy must consider the costs (risks) and benefits (protective factors) of phenomena under investigation.

Toward Real Science: Distinguishing Junk Science and Science Junk

Real science undoes itself. Real science gradually generates science junk. As real science progresses, new replicable findings recast existing, but irreproducible, knowledge and send it to the science junkyard. The process is typically very slow and it tends to repeat itself. “[T]he fate of all scientific endeavors is oblivion and the lucky scientist dies well before the first cracks appear in his edifice” (68, p. 58). A public health strategy must consider the costs (risks) and benefits (protective factors) of phenomena under investigation. A public health strategy cannot focus on just the social costs of gambling; it must consider the potential benefits. Without a balanced investigative portfolio, scientists might never have discovered the benefits of low level alcohol use. By its very nature, when real science investigates complex social phenomena, controversy will emerge. Science must challenge what is known to advance what will become known. “For sure progress depends on the ability of future generations to dismiss the past. Airplanes were not developed because men sang the praises of Icarus flapping his waxen wings” (68, p. 59).

Toward Theory-Guided Research

A commitment to real science is also a commitment to theory. Theory guides research; epidemiological prevalence research is no exception to this rule. To advance scientific understanding and the health of the public, new gambling-related research initiatives require well-developed theoretical maps to guide studies of the distribution and determinants of disordered gambling. In addition, scientific investigators, working as explorers, will need to identify where to apply their theoretical maps; this terrain will become the new territory of future prevalence research. For example, epidemiological research focusing on the distribution of gambling has established reliable base rates of gambling associated disorders across international boundaries. Consequently, gambling research should begin to follow the recommendations offered previously for psychiatric epidemiology. That is, once scientists identify the base rate of an illness with some degree of precision, then they should direct their attention to vulnerable groups with very high rates of the disorder and to hearty groups with very low rates of the disorder. This approach allows investigators to test causal hypotheses (66). “While it is unlikely that a single cause of mental disorders will be found, just as no single cause explains cancer or heart disease, the eventual aim of epidemiological research is to identify specific components in a causal chain of factors that produce an illness” (66, p. 3). Once causes are identified, research will determine that some of the causes are malleable; clinicians can then develop new prevention and treatment efforts to change these causes, thereby reducing rates of illness in a population (66).

Similar to the shifting definitions of AIDS and diabetes, the concept of pathological gambling likely will undergo transformations as scientists refine gambling-related theory, instrumentation, and research findings.² As scientific theory advances our understanding of gambling disorders, a “gold” standard likely will emerge. Indices that do not rely on the self-reported adverse consequences of gambling will provide a gold standard (e.g., neurobiological indices, psychosocial indices that accurately identify gambling problems but are not directly related to gambling or its consequences). Ultimately, this development will permit clinicians to improve the diagnostic sensitivity and specificity of screening instruments; in turn, this advance will make available improved opportunities for more effective treatment matching. Similarly, researchers will become better able to distinguish sub-types of gamblers, match people with the appropriate type and level of preventive and clinical services, and distinguish those individuals and groups that do not require intervention. In addition, screening instruments for adolescents, psychiatric patients, inmates, and various ethnic groups will improve as scientists develop more focused techniques for estimating the impact and consequences of gambling on these population segments. To accomplish these objectives, we must understand and remain cognizant of the relationship between theory and research.

Principle 2: Public Health Knowledge Derives from Population-based Observations

The Distribution of Gambling: Incidence and Prevalence

A public health approach to gambling considers the distribution and determinants of gambling and gambling-related health concerns across a population; this approach pays particular attention to vulnerable and resilient segments of that population. The distribution of phenomena (e.g., sickness, social events, gambling, gambling disorders, etc.) across the population refers to epidemiology. Incidence and prevalence are the cornerstones of epidemiology. Incidence refers to the number of new cases of a health problem during a particular period of time (e.g., past year). Prevalence refers to the total number of existing cases during a specified period of time (e.g., past year). When the number of new cases is equal to the number of cases that remit during a specified period of time, prevalence will remain constant. As a result, increasing incidence does not always yield higher prevalence rates. For example, when new and growing numbers of people (e.g., gamblers) enter the population segment of interest, the incidence of gambling problems likely will increase. However, this does not mean that the prevalence is increasing since the proportion of people with the problem of interest can remain steady (i.e., given that both a greater number of people enter the

²Similar conceptual shifts and compromises have been observed with regard to definitions of hypertension and elevated cholesterol levels.

Comparing Past Year Prevalence Rates of Mental Disorders

Disorder	%
Anorexia	0.1
Schizophrenia et al.	1.1
Kleptomania**	1.1
Panic Disorder	1.3
Anti-social Personality	1.5
Level 3 Gambling*	1.5
Social Phobia	1.7
Obsessive Compulsive	2.1
Level 2 Gambling*	2.5
Dysthymia	2.5
Drug Use Disorder	2.9
Major Depression	5.8
Alcohol Use Disorder	7.3

Narrow et al. (2002)
Arch. of Gen. Psych.

*Shaffer & Hall (2001)
Canadian J. Public Health.

**Lejoyeux et al. (1996)
American J. of Psychiatry.

population segment of interest, and the ratio of those with problems to those who gamble remain constant). This situation creates a seemingly convoluted and thorny problem: More resources are necessary to deal with the problem, but the problem prevalence remains in a stable state. Do circumstances like this require public health action (e.g., reshaping the treatment system, advancing new public policy, etc.) or is it more sensible to let nature take its course? Eventually, incidence must diminish as the population becomes saturated with people becoming new gamblers; similarly, sometimes when incidence of a health concern noticeably increases, awareness of the health risks increase and people in the prevalence pool begin to exit.

Levels of Gambling Prevalence

Just as burns are classified into degrees, cancer into stages, and diabetes into types, public health workers divide the prevalence of gambling into levels (71). Classification systems permit public health workers to divide a continuum of sickness across an entire population into more distinct sections that help to guide prevention, treatment and policy efforts for subgroups that have different levels of risk for developing gambling disorders. Using public health nomenclature or categories to describe a population has the added benefit of reducing the stigma that often is associated with pejorative language (e.g., “pathological,” or “problem”). Gambling researchers use levels ranging from 0 to 4 to describe the prevalence of gambling-related behavior. Level 0 represents people who do not gamble. Level 1 represents those people who gamble recreationally with no adverse consequences. When gambling behavior is associated with any of a wide-range of negative consequences, however, it is classified as level 2 gambling. Level 3 represents people with adverse consequences that are sufficiently serious and co-occurring so as to meet the diagnostic criteria for disordered gambling. Finally, gamblers enter level 4 when they seek help for their problem regardless of the extent of their distress.

One of the important implications of stratifying the distribution of gambling across a population is that, once classified, it is apparent that not all level 3 cases will seek treatment and not all level 1 cases will avoid treatment. Early in the development of the level system, I had thought that level 4 gamblers were level 3 gamblers who entered treatment. Soon, and with some thoughtful prodding by Henry Lesieur (personal communication), and evidence from research by Stinchfield and Winters (93), it was apparent that level 4 gamblers should not be limited conceptually to level 3 gamblers seeking treatment; rather level 4 gamblers must include all treatment seekers. Level 4 gamblers reflect a diverse group and public health treatment systems must be available for a wide variety of treatment seekers (81, 93).

Interestingly, there is very little scientific evidence revealing the prevalence of level 4 gamblers. This circumstance is due, in part, to the likelihood that gamblers seek and receive treatment in many settings other than addiction treatment programs. Non-specialists (e.g., clergy, primary care physicians, and general practice psychiatrists) often see many disordered gamblers—and sometimes do not even recognize this disorder (18).

Corollary: A public health perspective considers both broad and narrow biological, psychological and social determinants that can influence gambling and health

Determinants of Gambling

Gambling is a complex phenomenon; so too are the determinants of gambling behavior. Just as the public health host, agent and environment model helped to advance the understanding of many communicable diseases, a similar public health strategy encourages us to examine **individual gambler-level characteristics, gambling activities, and the social setting** (i.e., proximate and distal) within which they gamble. The interaction among these factors is essential to understand gambling and its effects. Taken together, these factors represent biological, psychological and social causes of gambling and the causes that shift gambling from a recreational activity to a disorder.

Gambling activities risk something of value on the outcome of an event when the probability of winning or losing is determined by chance (38)³. Games of chance are both formal and informal and come in a variety of forms that range from individual to social activities. Like drugs, each game has unique attributes that can increase or decrease risk factors influential in the development of gambling-associated problems. While a description of the different games of chance is beyond the scope of this article, readers should be aware that characteristics of these games can influence the social setting and contribute to the effects of gambling on the individual.

Corollary: A population-based public health strategy is very sensitive to vulnerable groups within the population

Social and Individual Determinants of Gambling Behavior

Epidemiological studies have identified certain segments of the population with vulnerabilities that place them at increased risk for developing gambling-related problems. Low socio-economic groups, elderly, adolescents, and those with co-morbid mental disorders have all been identified as possible high risk groups; there is a need to better understand the specific characteristics responsible for the increased risk. For example, there has been considerable interest in the relation between gambling and socioeconomic status. Evidence from Statistics Canada's

³ It is interesting to note that gamblers have variable awareness that they are putting something of value at risk, that the bet is irreversible, and that the outcome of the gambling is determined by chance.

People living in poverty perceive greater potential to change their lives from a gambling win than those of wealth. The opposite also is true: People with wealth perceive little opportunity to change their lives from a gambling win—unless the magnitude of the potential win reaches a particularly meaningful level.

Family Expenditure Survey (51) shows that, in general, gambling participation rates increase with household income. This pattern holds for the purchase of government and non-government lottery tickets, spending at casinos and use of slot machines (95). Bingo was the only gambling activity studied for which there was an inverse correlation with income. In terms of actual expenditures, high-income households spent more than low-income households on gaming activities (i.e., lotteries, casinos, slot machines, video lottery terminals and bingo). However, lower-income households spend *proportionately* more of their money on gambling than higher-income households. Given that some gambling revenue goes to the government (e.g., lotteries), these data have encouraged the view that gambling expenditures represent a voluntary regressive tax that proportionately has greater impact on lower incomes (10, 51).

The regressive tax idea can be misleading since taxes are levied; lower-income households voluntarily spend proportionately more of their income on gambling. Poverty often is associated with increased financial risk-taking, perhaps because of the psycho-economics of gambling (49). For example, people of lesser means play the lottery more than people of greater means (e.g., 10). People living in poverty perceive greater potential to change their lives from a gambling win than those of wealth. The opposite also is true: People with wealth perceive little opportunity to change their lives from a gambling win—unless the magnitude of the potential win reaches a particularly meaningful level. This psycho-economic driving force is powerful; it can subdue public health and other social setting forces that encourage abstinence or moderation. Consequently, in addition to increased rates of a variety of other health risks, the poor also are at increased risk for intemperate gambling and its potential consequences (10, 49). The psycho-economics of gambling is a complex determinant for gambling frequency and intensity; it also has multiple correlations with many other determinants of health status (e.g., smoking and drinking). Consequently, it provides the landscape against which pro- and anti-gambling forces interact to shape gambling patterns among various population segments.

Integrating Individual and Population Perspectives

As a relatively new field, gambling research has been concerned primarily with describing the **individual-level characteristics** of gamblers; this focus is consistent with the natural tendency toward scientific reductionism, that is, the tendency to oversimplify (e.g., 23). Since 1980, when the American Psychiatric Association first recognized intemperate gambling as a psychiatric disorder (2); this approach to understanding gambling emphasized a gambler's thoughts, emotions and physical attributes. In addition, this strategy focused on internal events

Figure 2: Past Year International Estimates

Adults	U.S. 1979*	U.S. 2001**	Sweden 2001***	Switzerland 2000 [†]	New Zealand 2001 [‡]	Great Britain 2000 [‡]	Africa 2001 [‡]	Hong Kong 2002
Level 1	97.05	96.75	98.00	97.0	98.7	99.3	—	94.1
Level 2	2.22	2.15	1.4	2.2	0.8	—	—	4
Level 3	0.73	1.10	0.6	0.8	0.5	0.7	1.1/1.4 [‡]	1.9 [*]

**(Kallick, Suits, Dielman, & Hybels, 1979)*

***(Shaffer & Hall, 2001)*

****(Volberg, Abbott, Ronnberg, & Munck, 2001)*

[†]*(Bondolfi, Osiek, & Ferrero, 2000)*

[‡]*(Abbott, 2001)*

[‡]*(Sproston, Erens, & Orford, 2000)*

[‡]*(Collins & Barr, 2001, GA 20 Questions/SOGS estimates)*

^{*}*(Centre for Social Policy Studies of The Department of Applied Social Sciences & The General Education Centre of The Hong Kong Polytechnic University, 2002)*

that can be associated with shifts from healthy to unhealthy gambling. For example, clinicians have speculated that gambling was an attempt to change a gambler’s feelings by distracting or shifting their attention. Treatment providers and researchers subscribing to this view developed a definition of disordered gambling and then created screening instruments based on the diagnostic criteria associated with these definitions.

Recently and because of its emphasis on population-based evidence, the public health perspective on gambling has encouraged a shift from a narrow focus on individual gamblers to a more expansive examination of the **social setting** (i.e., social factors that mediate gambling) (78). Just as classification and description is the foundation for understanding a data set, epidemiologic research represents the beginning phase for understanding population-based phenomenon. Consequently, many gambling researchers have embarked on a course of epidemiological study to describe the distribution and determinants of gambling in the general population. As I mentioned earlier, in gambling studies throughout the world, epidemiological evidence about the prevalence of gambling disorders has stabilized, and a relatively reliable description of the distribution of gambling involvement and gambling problems has emerged for many segments of the population (79). Thus, just when the public is beginning to understand the prevalence of gambling disorders, an integrative public health model encourages the era of general population prevalence studies to end in favor of population segment based research. This public health strategy toward gambling encourages examining the risk and protective factors that influence the transition from recreational to problem-related gambling and the identification of vulnerable demographic groups (e.g., ethnic differences associated with higher rates of gambling-related problems). Insights gained from study at

a broad, population-based analysis eventually will necessitate a return to an individual level of analysis to ascertain how the social, economic and cultural variables translate into health outcomes (78). Similarly, epidemiological studies of the general population eventually will become relevant again when it becomes necessary to evaluate the success of new gambling-related policy, prevention and treatment efforts. Both of these cycles reflect the maturation of a field. I encourage the integration of a traditional individualized psychosocial approach and a population-based public health approach; each tactic is essential to the study of gambling. These two approaches can and should inform one another, encouraging a recursive or self-repeating and integrated public health research strategy.

The Opposite of Population-based Strategy is an Isolated Case Approach

Isolated cases reflecting either the benefits or the adverse consequences of gambling represent a hazard to a public health perspective on gambling. For example, if we consider the development of a single gambling venue as evidence of the economic benefits of gambling, we do so at great risk. The economic benefits of gambling only can be judged across a population of communities that have various attributes. Only then can we determine the benefits and costs for these communities as a function of their characteristics. Benefits likely accrue to impoverished and isolated areas more than affluent urban areas. Similarly, the effect of gambling on isolated individual cases can produce very misleading conclusions. Some large lottery winners have done well while others have done poorly. Which isolated cases are we to use for an assessment of gambling? Though individual cases of suffering are vitally important and provide useful information, the foundation of a public health perspective is a commitment to large sets of information across the population. As I mentioned before and will again, attempts to interpret isolated cases carries considerable risk. Isolated cases must be evaluated in the context of population-based evidence.

The problem of isolated cases is often reflected by media coverage. For example, the extent of gambling problems in the general population is not necessarily related to the amount of media coverage of these problems. Events that occur relatively infrequently are often overestimated and frequently occurring events are often underestimated. Failing to recognize this problem can contribute to the development of gambling problems; lottery players tend to think the chances of winning are much greater than statistical probability. Similarly, casual observers will overestimate the prevalence of gambling problems among the general population if they read sensational newspaper accounts about gambling-related tragedies.

Principle 3: Public Health Initiatives are Pro-active

Corollary: Pro-active public health programs emphasize prevention and harm reduction

Since population-based research has shown that certain groups are more vulnerable to gambling problems than others, David Korn and I suggested (38) that a public health perspective protects and advances health by: (1) **preventing** gambling-related problems among individuals and groups at-risk for gambling addiction; (2) **promoting** balanced and informed attitudes, behaviors and policies toward gambling and gamblers both by individuals and by communities; and (3) **protecting** vulnerable groups from gambling-related harm. A public health perspective also ensures that preventing gambling-related problems is a community priority, along with the appropriate allocation of resources to primary, secondary and tertiary prevention initiatives. It also promotes mental health by building community capacity, incorporating a holistic view of mental health including the emotional and spiritual dimensions. To support these efforts, a public health perspective pays careful attention to the needs and aspirations of gamblers, individuals at-risk for developing gambling-related problems or those affected by at-risk people. Finally, a public health perspective attempts to foster personal and social responsibility for gambling policies and practices.

Proactively, public health workers dealing with gambling need to incorporate **harm reduction strategies and tactics** (e.g., 94). Rather than exclusively work toward the eradication of gambling-related problems, public health authorities should embrace harm-reduction strategies directed toward minimizing the adverse health, social and economic consequences of gambling behavior for individuals, families and communities. At the very least, these initiatives would include four components: (1) healthy-gambling guidelines for the general public (i.e., similar to low-risk drinking guidelines); (2) vehicles for the early identification of gambling problems; (3) moderation and abstinence goals for problem gamblers that can be offered non-judgmentally; and (4) systems for monitoring and reporting gambling-related participation trends as well as the incidence and burden of gambling-related illness.

Finally, a public health perspective encourages another pro-active strategy: **focus resources on the identification and treatment of level 2 gamblers**. Understanding the behavior of level 2 gamblers holds considerable potential to lower the social costs and harms associated with gambling disorders. “The common risk factors for many diseases are present in a large proportion of the population, and therefore, most of the cases of disease arise from the intermediate- and low-risk groups. Relatively small changes in risk among the middle-risk group can result

in a greater overall reduction in disease burden than do greater changes in the high-risk group” (8, p. 736). To illustrate, although level 3 gamblers represent people with a more intense and potentially destructive relationship with disordered gambling than their level 2 counterparts, this group is considerably smaller in numbers. In spite of the more moderate and potentially short-lived nature of the problems experienced by level 2 gamblers, their larger numbers are responsible for producing more adverse impact on society than their more disordered level 3 counterparts. This circumstance is very similar to the observation that problem drinkers are responsible for more aggregate social problems than their alcohol dependent counterparts (e.g., 89). As was the case with research on problem drinkers, future gambling research likely will reveal that level 2 gamblers are more responsive to treatment and social policy interventions than level 3 gamblers. Consequently, a public health strategy that promotes harm reduction and other secondary prevention objectives needs to attend more to level 2 gamblers than is now the case.

The Opposite of a Pro-active Public Health Perspective is Reactivity

Unfortunately, the antithesis of a pro-active public health principle is to react, after the fact, to the presence of gambling and related problems. A medical strategy, for example, would be to wait for problems to emerge and then treat them. This type of reactive strategy discourages the development of coordinated programs. Reactivity pits pro- and anti-gambling forces against each other as if these groups were working toward disparate goals. For example, while some anti-gambling groups oppose gambling on moral grounds and hold a strict prohibitionist posture, other anti-gambling forces are not opposed to gambling in general, but rather to the adverse consequences of gambling (e.g., human suffering). Pro-gambling forces are equally against the adverse consequences of gambling either because of genuine social concern or because of the negative impact on business. A pro-active rather than a reactive posture encourages both of these groups to come together to minimize any potential adversities associated with gambling. Unfortunately, as members of a cottage industry, both anti-gambling and treatment providers alike must paradoxically sustain gambling if they are to continue their current gambling-related purposes. Prohibitionists historically have increased interest in the objects of prohibition by those most at risk for developing problems; treatment providers sustain a manufactured interest in the adverse activity since they must focus on it to provide clinical services.

Principle 4: A Public Health Perspective is Balanced

A public health perspective toward gambling encourages the balance of many different perspectives. This balance includes a variety of

research-related issues as I will describe below. In addition, a public health perspective encourages communities to articulate and evaluate its social values toward gambling; by carefully identifying and classifying these values can community strategies successfully integrate values into a community strategy toward gambling.

Considering the Risk and Protective Factors

General Considerations

Given the tendency for public health to focus on population-related matters, there is a tradition in public health of addressing important, unpopular and controversial issues (38). For example, recently, this has included framing violence in society and gun control as legitimate areas for public health involvement. A public health approach to gambling is valuable because it offers a broad viewpoint on gambling and is not restricted to a narrow focus on gambling addiction. This position is similar to public health approaches toward alcohol, tobacco and other drugs.

The public policy arena only recently has provided the setting to examine and debate the long-term social, economic and health impacts arising from the dramatic expansion of gambling (e.g., 59). Controversy consistently surrounds the shifting social and political environment that has permitted the growth of gambling. For governments, there is considerable ambivalence as to the appropriate balance between permitting new gambling programs and regulating policies. For example, the government of Ontario, Canada, one of the largest owners of gambling operations in North America, reversed its policy to expand charity casinos throughout the province following widespread local controversy. Some church groups oppose the expansion of gambling on moral and ethical grounds. In the United States, the casino industry strenuously lobbies states and municipalities for opportunities to offer its gaming entertainment. Local communities engage in vigorous debate as to the impact of gambling on the community (e.g., safety, and quality of life for their neighborhoods and families, 24). Gambling regulators seem uncertain whether to promulgate regulations that target the gambling industry or gamblers: how people get exposed to gambling, how they gamble, or the consequences of gambling. State and provincial councils on compulsive or pathological gambling provide public education, help lines and referral services, as well as advocacy for people and their families affected by gambling-related problems that require treatment services and insurance reimbursement for such care.

Some critics of gambling have considered it as like both an environmental contaminant and an infectious agent. This view suggests that the presence of gambling opportunities causes adverse social and human effects (e.g., 11). This perspective reflects an exposure model of

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gambling and its impact on community health. During the 1990s, the matter of increasing gambling-related problems attracted considerable attention and debate. As gambling opportunities expanded around the world, some observers expressed concern that the rate of gambling-related disorders also was increasing because of this exposure. However, few studies provided empirical evidence about the nature of gambling exposure or its association with the prevalence of gambling disorders. In this section, we will consider the nature of gambling exposure and review studies associated with trends related to population segment prevalence rates.

Exposure and Adaptation⁴

Clinicians and researchers employ theoretical models to guide their treatment and research efforts. At the level of the individual, we can organize these models loosely into biological, psychological and social perspectives (i.e., biogenetic vulnerability, behavioral excess, and self-medication models). Until recently, however, gambling-related public health research has suffered from a paucity of theoretical models. Theoretical perspectives influence the way researchers examine gambling behavior. Theoretical models also have the potential to shape public policy. The following discussion illustrates the importance of a theoretical framework by examining how an environmental exposure model explains gambling problems and suggests the application of public policy.

Exposure

The idea of environmental “exposure” to social events and how these influences impact behavior changes has its roots in McGuire’s “resistance to persuasion” and “social inoculation” model (54). This model suggests that certain societal events (e.g., gambling, advertising) correspond to the social equivalent of exposure to germs. Exposure to gambling or gambling related events can “infect” people and lead to a shift in their experience, behavior and health status; the impact of this infection depends upon the individual’s capacity to resist the influence of such germs (i.e., social immunity). From a population perspective, more exposure translates to a greater likelihood of infection for an increasingly large segment of the population.

Multiple sources contribute to gambling exposure. Since gambling studies is a young field, these factors can be difficult to identify and measure. These sources of exposure likely include but are not limited to interpersonal (e.g., peer pressure), societal (e.g., advertising), civic (e.g., venues), and occupational factors (e.g., employment). Research on exposure has shown that some of these factors influence behavior. For example, studies have shown that interpersonal influences, such as peer pressure, are predictive of smoking and drinking behavior (9, 90).

⁴Portions of this section were adapted from Shaffer, LaBrie, and LaPlante (80, 81) and Korn and Shaffer (38).

To our knowledge, no scientific research has established a causal link between disordered gambling and either literal or figurative proximity to gambling. Similarly, no scientific research has established a direct link between community cues for gambling and increased urges to gamble—though this is one of the objectives of advertising. Many researchers, however, have noted their concern that a potential link exists between gambling availability and gambling behavior (e.g., 56, 62, 81, 85, 98). Some empirical evidence confirms the importance of this suspicion. For example, a recently published seven-year replication study conducted in Canada found that in one geographic region the proportion of local gamblers more than doubled after a local casino opened (42). Opening a new casino increased the incidence of people exposed to gambling. Specifically, prior to the casino, the number of area respondents who gambled was around 14 percent. After the casino opened, the number of area gamblers reached about 60 percent. During the same period, individuals from a regional control group without a local casino did not show similar changes in gambling patterns.

Occupation also might contribute to individuals' exposure. During the middle part of the 19th century, when epidemiology was taking root as a science, John Snow argued that if a trade truly causes adverse health consequences, then it should "...be extremely so to the workmen engaged in those trades..." (48, p. 5). Thus, if gambling exposure is the cause of adverse health and disordered gambling, then occupational experience with gambling is central to determining its impact. Consistent with this view, casino employees evidence higher prevalence rates of disordered gambling compared to non-casino employees from the general population (70, 73, 83).

It is difficult to conclude from this body of knowledge that exposure definitively affects gambling in a particular way since the existing studies independently explored different aspects of exposure. The cumulative effect of the different exposure sources has not been determined. However, two primary theories of exposure to gambling have developed.

An exposure model implies that the object of addiction causes addictive behavior. Exposure models suggest that the presence of environmental toxins (e.g., gaming settings) increase the likelihood of related disorders (e.g., pathological gambling). Volberg, for example, recently suggested that increasing access to gambling in the United Kingdom also would increase the incidence of problem gamblers: "...the number of opportunities to wager in a specified period of time—is tied to the development of gambling problems" (98, p. 1556). In a recent evaluation of a statewide gambling treatment program in Iowa, my colleagues and I found an association between regional variation in

exposure and variation in help-seeking for gambling problems; counties more proximate to gambling venues had significantly increased rates of help-seeking (82). An expanded exposure model purports that gamblers' vulnerable or resilient characteristics also play a role in determining the consequences of gambling exposure. For example, exposure to gambling will adversely impact only those who have an underlying vulnerability, but not those who are sufficiently resilient (e.g., 26, 31-33).

Adaptation

Alternatively, the social adaptation model suggests that gamblers are dynamic and capable of changing their behavior in response to exposure (74, 84, 103-107). The social adaptation model includes the idea that novelty often stimulates new interest in social activities, but participants eventually adapt to novelty and the effects of these new activities via social learning processes. Therefore, the effects of exposure are limited. For example, Volberg (99) found that adolescents from Nevada were less likely to participate in weekly or more frequent gambling than counterparts in four other states with far lower exposure to gambling. Furthermore, adolescents from Nevada were less likely to be level 3 or level 2 gamblers than peers from three of the four other states studied. For many, the process of adaptation can result in unexpected social change. That is, the early increases in new patterns of gambling—whether with or without adverse consequences—are typically followed by an adaptive process that leads to lower levels of involvement or abstinence. Social adaptation can result from decrements in the novelty effect, increases in adverse consequences, the emergence of competing interests, or a combination of these factors—even among some people who evidence fundamental vulnerabilities (e.g., 55, 77). To illustrate, in 19th century France, fascination with absinthe⁵ use increased and then diminished despite widespread exposure and little public policy pressure to stop (3, 97). Shifts in the social perception of absinthe from an attractive and chic aperitif to an intoxicant that caused absinthism, with its associated adverse effects, stimulated social adaptation that limited its widespread use (97).

⁵ Absinthe is a psycho-stimulant "...drink [that] was enormously popular in the late 19th century, particularly in France. French soldiers fighting in the Algerian conflicts of the 1840s had spiked their wine with wormwood extract (ostensibly to ward off fevers), and on their return to France their acquired taste was satisfied by absinthe, which contained a variety of essential oils including that of wormwood. Absinthe's popularity with the soldiers spread among their compatriots from all walks of life: some of the most creative people of the time were its devotees. Absinthe was said to evoke new views, different experiences and unique feelings" (3, p. 112).

While individual models of gambling behavior typically lack the scope necessary to shape policy, a public health model has the potential to guide public policy development. Every model holds the potential to uniquely influence policy-makers and the policies they promulgate. To illustrate, if policy makers subscribe to the exposure model, then they are likely to react very quickly by promulgating regulations designed to control gambling-related problems. However, if the model is accurate, they will have underreacted since the population is exposed already. If the model is incorrect, then they will have overreacted since other forces will

emerge to regulate gambling patterns. Conversely, if they subscribe to the adaptation model, then policy-makers are likely to react very slowly to changes in patterns of gambling among the population, because they believe that problems will self-correct. If the adaptation model is accurate, then there is little cost to waiting. However, if it is incorrect, then regulatory delays risk increased exposure and the incubation of gambling-related harms.

Corollary: A balanced public health view provides a broad perspective on gambling and is not limited to a focus only on gambling-related costs

Considering Costs and Benefits

Public health balance extends beyond concerns about the range of community values. Despite the countervailing influences of exposure and adaptation on gambling, there is a need to do some public health accounting. Public policy-makers are struggling to calculate a cost-benefit analysis of the factors associated with gambling. This is complicated precisely because a public health position recognizes that gambling can yield both potential costs and benefits. These considerations affect all aspects of the community, including health, social and economic dimensions. A cost-benefit analysis that incorporates the distribution of costs and benefits across a range of subgroups and vulnerable populations is essential to any evaluation of community impact. Only after weighing these matters can a public health strategy be developed that resolves important concerns and supports worthwhile initiatives.

The Costs: The Potential Adverse Consequences of Gambling

To begin an examination of the health and social costs of gambling, we review the potential negative consequences of gambling. The scientific literature and the mass media have attributed a range of difficulties for individuals, families and communities that might be related indirectly or directly to gambling (e.g., 41, 44). These unintended negative consequences can include:

1. **Gambling disorders**—a term that has been used to encompass a spectrum of problems experienced along the continuum that incorporates the constructs of problem and pathological gambling (e.g., 74);
2. **Family dysfunction and domestic violence** including spousal and child abuse (4, 22, 27, 46, 50, 57, 101);
3. Youth and **underage gambling** (e.g., 15, 71, 74, 76);
4. **Alcohol and other drug problems** (12, 13, 45, 83, 86, 91, 92);
5. **Psychiatric conditions** including major depression, bipolar

- disorder, antisocial personality, anxiety and attention deficit disorder (e.g., 5, 12, 13, 25, 34, 53, 69, 83);
6. **Suicide, suicidal ideation and suicide attempts** (4, 12, 13, 52, 63);
 7. Significant **financial problems** including bankruptcy, loss of employment and poverty as a direct result of wagering (6, 17, 20, 41, 44, 51);
 8. **Criminal behavior** ranging from prostitution and theft to drug trafficking and homicide (7, 20, 43, 60, 88).

Determining whether gambling causes each of these adversities has been—and remains—a knotty and hotly disputed matter. Research suggests that gambling can have a negative impact on health because of associated crime, substance abuse, poverty and domestic violence (e.g., 60). However, it is difficult to separate cause from effect. Do criminals gamble, or do gamblers become criminals? Do people with psychological disturbance gamble to treat their emotional circumstance (e.g., 26, 33), or does gambling stimulate these emotional disturbances (e.g., 96)? Like the use of psychoactive substances, these relationships likely are “dose”-related (i.e., the amount of money gambled, frequency of gambling, and the duration an individual has been engaged or exposed to gambling). However, as with the positive consequences of gambling, more research is necessary to resolve these important questions.

The National Research Council and the National Gambling Impact Study Commission (NGISC) concluded that it was not yet possible to determine if gambling caused crime, bankruptcy, domestic violence and a variety of other perceived adverse social consequences (59, 60). Some observers anticipated another set of findings. Therefore, to assure the integrity and validity of these conclusions, the U.S. General Accounting Office (GAO) conducted an independent review of the evidence and conclusions of the NGISC (19) and added their own research on the Atlantic City area. The GAO concluded that, “Neither NGISC nor our Atlantic City case study was able to clearly identify the social effects of gambling for a variety of reasons. The amount of high quality and relevant research on social effects is extremely limited. While data on family problems, crime, and suicide are available, tracking systems generally do not collect data on the causes of these incidents, so they cannot be linked to gambling. Sometimes data were available only at the county level, not for Atlantic City. Further, while studies have shown increases in social costs of pathological gamblers, it is difficult to isolate whether gambling is the only factor causing these problems because pathological gamblers often have other behavior disorders. While NGISC and our case study in Atlantic City found some testimonial evidence that

gambling, particularly pathological gambling, has resulted in increased family problems (such as domestic violence, child abuse, and divorce), crime, and suicides, NGISC reached no conclusions on whether gambling increased family problems, crime, or suicide for the general population. Similarly, we found no conclusive evidence on whether or not gambling caused increased social problems in Atlantic City” (p. 3).

The GAO also failed to find a relationship between gambling and bankruptcies. Consequently, to date, the state of scientific research simply does not permit the conclusion that gambling is the primary or contributing cause of a wide array of social problems. It can appear that gambling causes social problems, and *it even might be that gambling is a cause* of these social problems. However, given the commitment of a public health perspective on gambling to scientific research, it is important to note that the current state of scientific research simply does not permit this conclusion⁶ (19, 60).

The Benefits: The Potential Positive Health Impact of Gambling

Most gambling research has focused on its adverse mental health and social consequences. To date, with one notable exception (67), the study of gambling behavior has ignored the possibility of health gains associated with gambling. The possibility of “healthy” gambling (38, 79) might help to explain the attraction of gambling. After all, gambling has a negative expected value; therefore, in the absence of alternative explanations, gambling seems to be at odds with people behaving in their self-interest.

Since economic status can affect the emotional, intellectual, physical and social dimensions of an individual’s health (e.g., 16, 29, 102), it follows that gambling can as well. The concept of mental health promotion provides a promising new frame of reference and vocabulary for examining the potential health benefits of gambling. This approach to gambling and health examines the population segments affected by gambling, their mental health promotion goals and the settings within which these are realized. The benefits of gambling to mental health promotion can include:

- (1) **Social integration.** Gambling might provide a sense of connectedness and socialization through discretionary leisure time entertainment. Like going to a movie, being at a pub or participating in physical activity, going to a casino or horse race can provide a healthy change and respite from the demands of everyday life or social isolation. This might be particularly important for older adults.
- (2) **Adult play** (87). While scientists have long recognized the

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⁶ For an object or event to be a principal or necessary cause of another event, the causal object must be present and precede the consequential happening. However, the causal event also must be absent when the consequential event is absent. Further, when this circumstance fully predicts the presence or absence of the consequential event (e.g., suicide or bankruptcy), then the necessary causal event also is a sufficient cause. Anything short of this set of relationships leaves observers with the possibility of partial causes. For example, pathological gambling can be a contributing cause to bankruptcy, suicide or other social sequelae. To conclude that disordered gambling is a contributing cause, the rate of these social problems must increase when pathological gambling is present and decrease when gambling is absent. Pathological gambling must influence the rate of these social problems to be considered as a partial cause.

importance of play for the healthy development of children (100), play also might be particularly important for adults in reducing anxiety, stress and dysphoria (1, 14, 30).

- (3) **Enhancement of coping strategies** by building skills and competencies such as memory enhancement, problem solving through game tactics, mathematical proficiency, concentration and hand-to-eye physical coordination.

Health benefits also can accrue to communities through gambling-related economic development. Empirical data from population health studies demonstrate a direct relationship between income, employment and health status, as described earlier. Local communities, particularly those with economic problems, can gain significant economic benefit through gambling (60). Casinos, for example, can act as a community catalyst for economic development. The benefits generally include the creation of jobs in the gaming industry that, in turn, stimulate other sectors such as tourism and hospitality. However, observers should interpret projected community health status improvements associated with gambling expansion and local economic development with caution because these economic gains must be sustainable to have a positive health impact. As yet, other than for originally impoverished areas, these long-term economic gains for communities have not been demonstrated and currently rest on a complex analysis of projected economic benefit and wealth generation (58-60). Where charitable gaming exists (e.g., bingo), gambling-generated monies can go directly to support local nonprofit and charitable organizations in areas such as education, environment, and youth sport organizations. This additional source of revenue can strengthen community capacity by enhancing the health, social service, recreational and cultural infrastructure. Importantly, gaming generates revenue for state, provincial and municipal governments, which also can be used to build social capital and reduce reliance on taxation.

Estimating the Cost and Benefits

For communities, groups and individuals, the central public health question is whether gambling adds or detracts from the quality of life. Estimates of the health, social and economic costs of problem and pathological gambling have been proposed but the methodologies require further refinement (60). The NGISC estimated that the annual cost for problem and pathological gamblers is \$5 billion (U.S.) per year and an additional \$40 billion (U.S.) in lifetime costs for productivity reductions, social service, and creditor losses. Where casinos have been introduced into a community, unemployment rates, unemployment insurance and welfare payments decline by one-seventh and earnings rise in

construction, hospitality, transportation, recreation and amusements sectors (20). Politzer, Yesalis and Hudak suggest that each problem gambler negatively affects 10 to 17 people around him or her, including family, employer and government (64). However, taken together, the current state of gambling costs *and* benefits research rarely highlights the distribution of costs and benefits. Consequently, contemporary cost-benefit estimates fail to provide certainty about the nature of this relationship at either the community or the individual level of analysis.

The Opposite of Public Health Balance: Bias

Currently, the antithesis of a balanced public health perspective on gambling is a bias that encourages the ends to justify the means when health and social adversities are at stake. That is, since problems can be associated with gambling, public policy-makers must intervene to limit gambling, as if no other balancing forces could limit the consequences of gambling. Isolated cases of gambling-related problems—though troubling and tragic for those touched by these problems—represent a dilemma for a balanced public health perspective. Isolated cases might not be representative of the population, thereby violating the population-based evidence principle. Further, isolated cases that are not representative hold potential to lead policy-makers and scientists to misunderstand the risks and benefits of gambling. This kind of mistake could lead to treatment or policy decisions that are too restrictive or too liberal. Both of these problems represent important concerns for a democratic society where the majority opinion has a special status—though, to be successful, the rule of the majority should provide protection for the minority.

Conclusions

Four principles characterize a public health perspective on gambling. Each principle represents a strategic position that compels both pro- and anti-gambling subscribers to pause and consider the merits of their respective positions. These positions often emerge from subjective opinions and selective use or misrepresentations of research. However, subscribing to the four principles described in this article requires a reconsideration of the evidence.

It is important to recognize that the public health view tends to shift the gaze of research and public policy toward broad-based population considerations. However, despite this tendency, a public health perspective does not eliminate the importance of individual experiences (78). Instead it integrates both personal and population-based evidence

into our understanding of gambling and other health-related concerns. Finally, a public health perspective rests upon broad-based scientific principles that guide the interpretation of evidence requiring rigor while simultaneously acknowledging the values of the community. As public health science advances, public policy debates follow. This is the inevitable wake that follows efforts to translate scientific research into practice and public policy within a social setting that cannot easily distinguish science from junk science.

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