Social Indicator-Based Measures of Substance Abuse Consequences, Risk, and Protection at the Town Level

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The Massachusetts State Needs Assessment Project (MassSNAP) developed and assessed social indicator-based measures of substance abuse consequences, risk, and protection at the town level. Structural equation models using longitudinal data showed that higher levels of the risk index were associated with subsequent increases in the index of substance abuse consequences, when autocorrelation and reciprocal and contemporaneous associations of these indexes were controlled for. Similar models indicated that (1) higher levels of the diversity of non-profit, community-based organizational activities were associated with subsequent declines in the risk index; and (2) an increase in the diversity of these activities for two successive years was also associated with subsequent declines in the risk index. The theoretical and planning implications of these measures are discussed.

KEY WORDS:

INTRODUCTION

State prevention planners have increasingly sought to assess substance abuse prevention needs and allocate resources at the local level (Brown and Corbett, 1997). A primary approach to such needs assessment has been to apply a risk and protective factor framework to substate planning areas, such as counties (ADAS, 1997; OASAS, 1997). This framework has led to a recognition that local needs...
increase the likelihood that he or she will engage in substance use and/or abuse. Protective or resiliency factors are those aspects of the environment that enable an individual in a high risk environment to resist using substances. The environment that encompasses risk and protective factors can be usefully categorized into domains, representing aspects of the individual, his or her peers, family, school, and community.

It is to be emphasized that risk factors at the individual level of analysis, even in the community domain, cannot be assumed, when aggregated, also to be risk factors at geographic- or population-based levels of analysis (Gruenewald et al., 1997). We propose that risk factors for a town (or other geographic area) be defined as those aspects of the town environment that increase the likelihood that the town will have high levels of substance abuse and/or problems thought to be direct consequences of substance abuse. We note that a high level of substance abuse in a town may itself be an indicator of risk, as well as a result or outcome, in that it may reflect exposure to, and local norms about, substance use and abuse.

We similarly propose that protective factors for a town be defined as those aspects of the town environment that tend to reduce subsequent levels of risk factors or of substance abuse-related problems, or that mitigate the effects of risk factors. As with risk factors, aggregations of individual-level protective factors cannot be assumed to constitute town-level protective factors; the existence of the latter must be empirically demonstrated.

Social Disorganization, Social Capital, and Community Resources

Although theory underlying the risk and protective factor framework for individuals has been elaborated, theory linking risk and protective factors for a geographic area with subsequent levels of substance abuse is much less developed. In developing and testing measures of town risk and protection, we drew upon the literatures of social disorganization, social capital, and community resources. Social disorganization has been empirically tested in relation to crime, using social indicator data. Social capital and community resources, to our knowledge, have not been empirically tested using social indicators.

Social Disorganization

The concept of social disorganization developed from the observation that certain urban areas maintained high rates of crime and delinquency, despite the predominance among residents of a succession of different ethnic groups. In the classical statement of the theory, Shaw and McKay (1942) argued that three structural factors—low economic status, ethnic heterogeneity, and residential mobility—led to the disruption of community social organization, which, in turn, accounted for variations between communities in crime and delinquency.
a key in maintaining the disadvantages associated with poverty (Tigges, Browne, and Green, 1997). If social cohesion measures participation in community resources, social capital refers to the identification and accessing of those resources and using them to enhance social cohesion (Hirschfield and Bowers, 1997). Thus, like social cohesion, high levels of social capital may provide protection against social problems.

Both social cohesion and social capital appear closely linked to an important category of resources available to community members, namely, the presence of non-profit, often mission-based, organizations in a community and the activities they conduct (Kretzman and McKnight, 1993). Such organizations may contribute directly to positive community outcomes, as in the cases of non-profit community development organizations (Robinson, 1996) and religious organizations (Maton and Wells, 1995). More generally, the diversity of activities conducted by local non-profit organizations and associations may reflect both the diversity of resources available in a community and the potential for diverse community members to access those resources in addressing social problems (Kretzman and McKnight, 1993). In addition, increases in the diversity of these activities may reflect the presence of underlying positive community processes such as increases in the diversity of available resources (Kretzman and McKnight, 1993).

**Present Study**

The present study developed three sets of measures associated with relative town needs for substance abuse prevention services:

1. an index of substance abuse consequences, or substance abuse-related problems, based on indicators such as deaths or hospitalizations associated with substance abuse, and disease conditions thought to be direct consequences of substance abuse;
2. an index of risk for substance abuse-related problems, based on indicators drawn from risk factors at the individual level of analysis and from the social disorganization literature;
3. measures of protection from substance abuse-related problems and/or risk for such problems, based on indicators drawn from the social capital and community resources literatures. These measures include an index of the diversity of community-based, non-profit organizational activities, and a dichotomous variable measuring whether or not an increase occurred in the activity diversity index for two successive years.

By using longitudinal data, the study's strategy was to test the power of the risk index to predict increases in the index of substance abuse consequences. Once the risk index had been established, we were able to test the power of the measures of protection to predict decreases in substance abuse consequences and/or risk.
indicator should: (1) have high face validity; (2) be available for every town; (3) be available in other states, for possible replication studies; (4) show variability across towns; (5) have any missing town data not be systematically missing; and (6) be available annually, to allow for longitudinal validity testing. In addition, because the CI and RI are composite indexes, the indicators selected for each of them should load on a single factor.

Substance Abuse Consequences Index (CI)

Based on their high face validity, we examined a number of indicators for possible inclusion in the CI. Data were examined for 1993–1995, the three most recent years for which indicator data were available. In all cases, the indicators were obtained as numbers of cases, which we then converted to rates per 100,000 population (see below). Applying the above inclusion criteria resulted in an index consisting of the following indicators:

1. Deaths attributed to substance abuse (substance abuse was listed among the first 10 contributing causes of death)
2. Hospital discharges attributable to substance abuse (substance abuse was listed among the first 10 diagnoses for each discharge)
3. Fetal syndrome cases
4. New intravenous drug use (IDU) AIDS cases

Risk Index (RI)

We examined indicators thought to be associated with substance abuse risk, based on a survey of needs assessments in other states and from a review of the literature of individual-level risk factors. We excluded from consideration the indicators included in the CI, even though they might reflect community exposure to alcohol, tobacco, and other drugs (ATOD). Applying the inclusion criteria to these potential indicators resulted in an index consisting of the following indicators:

1. Participants in the Women, Infants, and Children (WIC) Program
2. Medicaid cases
3. Unemployed individuals
4. Liquor licenses for the sale of all alcoholic beverages
5. Liquor licenses for the sale of beer and wine only
6. Participants in the Early Intervention Program

A description of the full range of indicators considered, their sources, and reasons for the exclusion of those excluded, for both the Substance Abuse Consequences Index and the Risk Index, is available from the first author.
set of indicators. To construct each index, we computed the mean of the relevant transformed indicators within a year for each town. To partially restore the original metric, we then squared the mean, creating our yearly index.

**Activity Diversity Index**

To measure the diversity of non-profit, community-based organizational activities, we used the Shannon Diversity Index (Magurran, 1988: 34–35) applied to the 11 activity categories listed above. This index is commonly used by ecologists to measure species diversity within an ecological niche. If \( p_i \) represents the proportion of the total number of organizational activities in a town reported in category \( i \), then the index of town activity diversity \( (DI) \) is given by:

\[
DI = - \sum p_i \log p_i, \quad \text{summed over } i = 1 \text{ through } 11, \text{ the number of activity categories.}
\]

Because the logarithm of a positive number less than 1 \( (p_i) \) is negative, the value of \( DI \) is always positive or 0. \( DI \) has a minimum value of 0 when the town has no activities or only a single category of activities; it increases with the number of activity categories. For a given number of activity categories, \( DI \) is at a maximum when all the categories have the same number of activities.

**Reliability**

We assessed the internal reliability of the CI and RI for each year using Cronbach's Alpha. This is an estimate of the extent of measurement error with which the indicators included in each index measure an underlying construct. For all three indexes, we also assessed the extent to which measurement error changed over time (the temporal analog of test/retest reliability), and the extent to which the underlying construct changed (temporal stability). Heise (1969) argues that when a variable is measured with measurement error at three points, it is possible, based on the correlations among the observed measures, to separate out variation in the accuracy with which the variable is measured from variation in the variable itself. More specifically, each index is presumably an imperfect measure of an underlying construct. If the correlation between the observed values of the index at times 1 and 2 (i.e., 1993 and 1994) is \( r_{12} \), that between the observed values at times 2 and 3 (1994 and 1995) is \( r_{23} \), and that between times 1 and 3 (1993 and 1995) is \( r_{13} \), then an estimate of the test-retest reliability for the index from 1993 to 1995 is given by: \( r_{12} r_{23} / r_{13} \). Estimates of the temporal stability of the underlying construct measured by the index are given by: for 1993–1994: \( r_{13} / r_{23} \).

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7 Details of the confirmatory factor analysis for each index are available from the first author.
Fig. 1. Model 1: Validity test of the risk index two-year lag. CL93, CL95: Substance abuse consequences index for 1993 and 1995, respectively. These unobserved variables are measured, with measurement error, by the observed values of this index for 1993 and 1995 (c93 and c95). Measurement error is estimated using index reliability. RL93, RL95: Risk Index, for 1993 and 1995, respectively. These unobserved variables are measured, with measurement error, by the observed values of this index for 1993 and 1995 (r93 and r95). Measurement error is estimated using index reliability. Error.a through error.d: measurement errors associated with the indexes. Error.1 through error.4: errors of prediction of the endogenous variables (see discussion in text). Variables in rectangles represent observed variables, Variables in ovals represent unobserved variables. The curved, double-headed lines represent covariances between exogenous variables, between errors of prediction of the endogenous variables, and between measurement errors of the endogenous variables. The straight, single-headed lines represent paths. (Terms defined in text.)

its measurement errors for the two years to covary (Joreskog, 1977). Thus, in Fig. 1, error.a was allowed to covary with error.c, and error.b with error.d. To help identify the model, equality constraints were placed on the variances of the measurement errors for the 1993 and 1995 CI and for the 1993 and 1995 RL.

We generated global measures of the fit of Model 1—and of Models 2 and 3 described below—to the data (Hayduk, 1987). Measures of fit assess whether the model as specified closely reflects relationships inherent in the data, and whether additional relationships need to be specified. An adequate fit is necessary in order to interpret the statistical significance of individual parameter estimates.
not possible to estimate its measurement error using internal consistency. For this reason, it is treated in Model 2 as an observed, rather than latent, variable. Thus, this model tests the two-year lagged effect of the DI on the CI and RI, controlling for prior values of the CI and RI and for reciprocal effects of the CI and RI on the DI.

We also explored possible effects of increases in the DI. We created a dichotomous variable equal to one for those towns where the DI increased in both 1994 and 1995; that is, where DL.94 > DL.93 and DL.95 > DL.94 (there were 215 such towns); and equal to zero otherwise. As displayed in Fig. 3, Model 3 incorporates

![Diagram](image_url)

Fig. 3. Model 3: Validity test of increase in the activity diversity index. CL.93, CL.95: Substance Abuse Consequences Index for 1993 and 1995, respectively. These unobserved variables are measured, with measurement error, by the observed values of this index for 1993 and 1995 (c93 and c95). Measurement error is estimated using index reliability. RL.93, RL.95: Risk Index for 1993 and 1995, respectively. These unobserved variables are measured, with measurement error, by the observed values of this index for 1993 and 1995 (r93 and r95). Measurement error is estimated using index reliability. DL.93, DL.95: Dichotomous variable equal to 1 for those towns for which DL.94 > DL.93 and DL.95 > DL.94, and equal to 0 otherwise. DL.93, DL.94, DL.95: Activity Diversity Index for 1993, 1994, and 1995, respectively. Error_a through error_d: measurement errors associated with the indexes. Error_1 through error_5: errors of prediction of the endogenous variables (see discussion in text). Variables in rectangles represent observed variables. Variables in ovals represent unobserved variables. The curved, double-headed lines represent covariances between exogenous variables, between errors of prediction of the endogenous variables, and between measurement errors of the endogenous variables. The straight, single-headed lines represent paths. (Terms defined in text.)
suggesting in each case that the indicators included are measuring a single underlying construct. We also assessed the test/retest reliability and the temporal stability of the CI and RI, as well as of the DI (Table I). We note that there is good evidence that the measurement error with which the indexes are measured changed little over time. The underlying constructs measured were also quite stable for each interval.

Validity

Table II presents a correlation matrix for the variables included in Models 1, 2a, and 3 below.

Substance Abuse Consequences Index and Risk Index

The indicators included in the CI were all chosen for their high face validity as measures of substance abuse consequences. Table III presents the results of analyzing Model 1, testing the effects of the RI on the CI with a two-year lag. As initially specified, Model 1 achieved a satisfactory fit to the data. The model's Chi-square value was 3.82 with 5 degrees of freedom \( (p = .576) \), indicating that the associations actually observed in the data did not differ significantly from those implied by the model. The Goodness-of-Fit Index (GFI) was .995, the Adjusted Goodness-of-Fit Index .972, and RHO .982, again indicating a close fit between the model and the data.

As expected, the results indicate that population density, poverty, and ethnic heterogeneity were all positive predictors of the CI in 1993. They also indicate that population mobility was a negative predictor of the CI in 1993. That is, when the other structural variables were controlled for, towns with a higher proportion of residents who had moved in the five years prior to 1990 had a lower incidence of substance abuse-related problems in 1993. In addition, poverty (positively) and ethnic heterogeneity (negatively) were significant predictors of the RI in 1993. Thus, controlling for population density, population mobility, and poverty, greater ethnic diversity in a town was associated with lower town risk.

Also as expected, each index predicted itself from 1993 and 1995, and there was a significant association between the CI and RI in 1993 but not in 1995 (as reflected in the correlations between their errors of prediction). Controlling for these associations, the effects of the structural variables, and for measurement error, the results further indicate that the RI in 1993 significantly \((p < .001)\) predicted the CI in 1995, but that the CI in 1993 did not predict the RI in 1995. That is, towns higher in risk in 1993 were subject to increased substance abuse-related problems in 1995 compared to 1993. Overall, the model accounted for 62% of the variance in the CI in 1995 (when the 1995 RI was included as a predictor).
Table III. Validity Tests of Risk Index (RI)

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Independent variables</th>
<th>Population density</th>
<th>Population mobility</th>
<th>Poverty</th>
<th>Ethnic diversity</th>
<th>CL.93</th>
<th>RL.93</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT.93</td>
<td></td>
<td>.722***</td>
<td>−.097*</td>
<td>.432***</td>
<td>.186***</td>
<td>.529</td>
<td></td>
<td></td>
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<tr>
<td>RL.93</td>
<td></td>
<td>.034</td>
<td>.027</td>
<td>.859***</td>
<td>−.204**</td>
<td>.608</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT.95</td>
<td></td>
<td>.569***</td>
<td>.245***</td>
<td>.622</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>RL.95</td>
<td></td>
<td>.052</td>
<td>.951***</td>
<td>.972</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Correlations between exogenous variables
- Population mobility: .590***
- Poverty: .371***
- Ethnic diversity: .566***

Significant correlations between error terms for endogenous variables
- Between errors of prediction for CT.93 and RL.93: .545***
- Between errors of measurement for indicators of RL.93 and RL.95: .631*

Chi-square = 3.818, degrees of freedom = 5, p = .576; GFI = .995, AGFI = .972, RHO = .982; maximum likelihood estimates N = 351. *p < .05, **p < .01, ***p < .001, two-tailed test. CT.93, CL.95: Substance abuse consequences index for 1993 and 1995, respectively. RL.93, RL.95: Risk Index for 1993 and 1995, respectively.

and 53% of the variance of the CI in 1993 (when the RI was not included as a predictor).8

Activity Diversity Index

We tested the effects of the DI on changes in the CI and RI (Fig. 2, Model 2). Examination of the residuals of Model 2 suggested that the relationship between the 1993 DI and the 1995 values of the RI was nonlinear. To explore this nonlinearity, we added a quadratic term (the square of the DI in 1993) to Model 2. Results of analyzing this quadratic model are shown in Table IV, Model 2a. To achieve an adequate fit with the data, we added predictive links from poverty and from ethnic diversity (both in 1990) to the DI in 1995. That is, the effects of these structural variables on the DI were not fully captured by the 1993 values of the DI. With these additional links, Model 2a adequately fit the data. Its Chi-square value was 9.973 with 12 degrees of freedom (p = .618), its GFI was .995, its AGFI was .972, and its RHO was .984.

We observe that the same effects as seen in Model 1, of the structural variables on the 1993 CI and RI, and of the 1993 RI on the 1995 CI, are present in

8We replicated this model for the CI and RI for 1992 and 1994. The results matched those shown for Model 1 with the exception that population mobility was not a significant predictor of the CI in 1992. In particular, the RI in 1992 significantly predicted the CI in 1994, but not conversely. Details of these results are available from the first author.
Table IV. (Continued)

Model 2b: Two-year lag for DI, restricted sample (standardized coefficients)

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Population density</th>
<th>Population mobility</th>
<th>Poverty</th>
<th>Ethnic diversity</th>
<th>CL93</th>
<th>RL93</th>
<th>DL93</th>
<th>R²</th>
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<td></td>
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</tr>
<tr>
<td>CL93</td>
<td>.099</td>
<td>-.230***</td>
<td>.725***</td>
<td>.231**</td>
<td></td>
<td></td>
<td></td>
<td>.710</td>
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<tr>
<td>RL93</td>
<td>-.079</td>
<td>.017</td>
<td>.870***</td>
<td>-.077</td>
<td></td>
<td></td>
<td></td>
<td>.627</td>
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<tr>
<td>DL93</td>
<td>.094</td>
<td>.189</td>
<td>-.028</td>
<td>.292*</td>
<td></td>
<td></td>
<td></td>
<td>.214</td>
</tr>
<tr>
<td>CL95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.767**</td>
<td>.227**</td>
<td>-.008</td>
<td>.900</td>
</tr>
<tr>
<td>RL95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.010</td>
<td>.998***</td>
<td>-.053*</td>
<td>.986</td>
</tr>
<tr>
<td>DL95</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.244*</td>
<td>-.004</td>
<td>.338***</td>
<td>.223</td>
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Correlations between exogenous variables

<table>
<thead>
<tr>
<th></th>
<th>Population mobility</th>
<th>Poverty</th>
<th>Ethnic diversity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population mobility</td>
<td>.247**</td>
<td>.456***</td>
<td>.603***</td>
</tr>
<tr>
<td>Poverty</td>
<td></td>
<td>.640***</td>
<td></td>
</tr>
<tr>
<td>Ethnic diversity</td>
<td></td>
<td></td>
<td>.557***</td>
</tr>
</tbody>
</table>

Significant correlations between error terms for endogenous variables

Between errors of prediction for CL93 and RL93: 4.74***
Between errors of prediction for RI93 and DL95: -.628**

Chi-square = 15.499, degrees of freedom = 14, p = .345; GFI = .980, AGFI = .922, RHO = .962; maximum likelihood estimates Sample restricted to towns where DL93 > 0 and DL94 > 0 (N = 149). * p < .05, ** p < .01, *** p < .001, two-tailed test. CL93, CL95: Substance abuse consequences index for 1993 and 1995, respectively. RI93, RI95: Risk index for 1993 and 1995, respectively. DL93, DL95: Activity diversity index for 1993 and 1995, respectively.
Model 2a. Three effects in relation to the DI are particularly noteworthy. First, both population density and ethnic diversity (in 1990) predicted the DI in 1993. Ethnic diversity predicted the DI in 1995 as well. Second, the CI in 1993 significantly (positively) predicted the DI in 1995 and poverty negatively predicted the DI in 1995, suggesting that towns with higher substance abuse-related problems in 1993 and/or towns with lower poverty tended to have increases in activity diversity from 1993 to 1995.

Third, with respect to the RI in 1995, the coefficient of the quadratic term (DI^2) was significant and negative, while the coefficient of DI was significant and positive. This third effect suggests an association between the 1993 DI and 1995 RI that is parabolic, resembling an inverted "U" shape. To ascertain the approximate transition point of this association, we took the partial derivative of the structural equation implied by this model (Hayduk, 1987). Examination of the partial derivative suggested a transition, from positive to negative effects of the 1993 DI on the 1995 RI, at a value of about .6 for the 1993 DI (the 1993 DI ranged from 0 to 2.2).

To explore this third effect further, we analyzed the model in Fig. 2 using those towns for which the DI was greater than zero in 1993 and in 1994 (N = 149). That is, we sought to test whether higher levels of the DI were associated with subsequent reductions in the CI or the RI, in those towns which had a positive level of the DI during the years encompassed by the model. Results of analyzing this model are presented in Table IV as Model 2b. Without modification, the original model provided an adequate fit to the data (Chi-square equal to 15.499 with 15 degrees of freedom, p = .345, GFI equal to .980, AGFI equal to .922, RHO equal to .962). In this model, the control variables of population mobility, poverty, and ethnic diversity significantly predicted the CI in 1993; poverty alone significantly predicted the RI in 1993; and ethnic diversity significantly predicted the DI in 1993. Each of the indexes in 1993 significantly predicted its values in 1995. There were three cross-index effects: (1) the RI in 1993 significantly predicted the CI in 1995; (2) the CI in 1993 significantly predicted the DI in 1995; and (3) the DI in 1993 significantly negatively predicted the RI in 1995. Effects (1) and (2) corroborate in this sample what we found above for all 351 towns. Effect (3) provides further evidence that the DI is measuring town protection: in towns with matching RI in 1993, those with higher values of the DI in 1993 tended to have lower RI values in 1995 (among towns where the DI was non-zero in both 1993 and 1994). It is sobering to note the relative magnitude of this effect, however. In terms of standardized coefficients, the magnitude of the negative effect of the 1993 DI on the 1995 RI was approximately one-twentieth the (positive) effect of the 1993 RI on the 1995 RI.

We tested the effect of the 1993 DI on the effect of the 1993 RI on the 1995 CI, by means of an interaction term between the 1993 CI and RI incorporated into Model 2. In this way, we explored whether the DI mitigated the effect of the RI
The study has several limitations that need to be addressed in future research. First, we have examined data for three years only, the most recent years for which these indicator data were available. Although data were available prior to 1993, the levels and, to an extent, the diversity of recorded organizational activities were considerably lower than in 1993 and later. To adequately test for town protection, we sought years for which our measures had a reasonable expectation of having an effect. Thus, it will be important to replicate this study by extending the analyses using data from 1996 and later, as they become available.

Replicating the study, particularly the measures of community protection, in other states would also be important, for at least two reasons. First, as noted, the levels and diversity of organizational activities have increased during the past decade. In Massachusetts, this growth appears primarily to reflect the increasing privatization of services formerly carried out by state and local government. It may also reflect, to a lesser degree, non-profit organizations’ increased awareness of the need to file activity information with the IRS. The extent to which these trends are present, and the role of the non-profit sector in community settings, may vary in other states. Hence the need to investigate the effects of the DI in other state and local contexts.

Second, for reasons of data availability, we have identified problems or consequences directly associated with substance abuse, rather than substance abuse prevalence, as our outcome variable for assessing risk and protection. In other states, prevalence measures, especially for youth, may be available at local levels. The use of prevalence as a geographic-level outcome may illuminate somewhat differently the application of the risk and protective factor framework to geographic areas.

A third limitation of the study is that we have performed analyses assuming that towns, the unit of analysis, represented independent observations. It is likely that they do not, because town characteristics tend to evolve partly in response to geography and partly in response to characteristics of surrounding towns. Future analyses should attempt to incorporate emerging techniques for modeling geographical interdependence (Wieczorek and Hanson, 1997).

Conclusions

The study demonstrated the applicability of the risk and protective factor framework to the town, or geographic, level of analysis. Specifically, it demonstrated that protection, as well as risk and substance abuse-related problems, can be measured using social indicator data. There are several ways in which the results illuminate how the risk and protective factor framework applies at geographic levels, with important implications for prevention.

First, our results imply that a structural perspective, such as that embodied in Social Disorganization Theory, is a useful perspective from which to view town-level substance abuse-related problems. Across all towns, substance abuse-related
sequence of associations, in fact, suggests a possible feedback loop among risk, problems, and protection. The two-fold nature of the measures—that they embody a kind of structural stability of communities as well as illuminate areas of possible change—leads to a number of implications for primary prevention.

**Implications for Prevention**

The relative stability of the CI, RI, and DI over time implies that they are informative in generating multi-dimensional profiles of town prevention needs and potential resources. Such profiles can inform the allocation of resources at state and regional levels and can be used to help assess existing resource allocations. The inclusion of the DI in local needs and resource assessments encourages prevention planners to consider the diversity of resources available in a community as well as its problems, and to take such local resources into account in allocating additional resources. For example, moderate to high levels of the DI may reflect the presence of active organizations that collectively could make effective use of additional resources. Low levels of the DI may reflect the absence of such an infrastructure and, in conjunction with high levels of problems, the consequent need for one to be established.

This line of reasoning suggests that, in addition to informing the amount of resources allocated to a community, such profiles can inform the kinds of resources applied. We have found that patterns of assistance provided by Massachusetts' Regional Prevention Centers to communities within their service areas—as characterized by types of assistance, health focuses, organizational clients, and population groups present at and targeted by the assistance—vary systematically according to such community profiles (Kreiner et al., 1997). Thus, assessing a community's relative levels on the three indexes can help shape more tailored prevention work in the community, in addition to informing the overall amount of such work. Baseline community profiles would also be important in comparatively assessing community progress in addressing problems.

Use of the measures to identify areas of possible change has two additional implications for primary prevention. First, the measures can be used to identify communities that are relatively high in risk yet moderate in substance abuse-related problems. Our results imply that such communities will tend to have increased levels of substance abuse-related problems within two years. They consequently appear to be prime targets for primary prevention interventions seeking to prevent increased levels of such problems. Given the overall stability of substance abuse-related problems, such communities may represent sites where the application of prevention resources has greater leverage than when applied only to communities where problems are already high.

Second, our results point toward the importance of non-profit organizations and their activities in community-based prevention. Although the magnitude of
Measures of Substance Abuse Consequences, Risk, and Protection


Kretzmann, J.P. and McKnight, J.L. (1993). Building communities from the inside out: a path toward finding and mobilizing a community's assets. Evanston, IL: Center for Urban Affairs and Policy Research, Northwestern University.


