The economics of AIDS-related health insurance regulations: Interest group influence and ideology*

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Abstract. The projected growth in the U.S. in the number of persons with AIDS has created concern about sources of financing the costs of health care services for persons with AIDS. Private health insurers have modified or considered modifying underwriting practices in response to the AIDS epidemic, but several state governments have developed significant regulatory constraints on AIDS-related underwriting practices. We model the state government's decision to impose AIDS-related regulatory constraints (HIV testing restrictions, restrictions on the use of information about sexual orientation, and mandated AIDS coverage). We find that HIV-testing restrictions tend to be more likely in states with relatively high AIDS prevalence rates and insurance industries that are relatively weak politically. States with prevailing attitudes favorable to persons with AIDS (i.e., relatively liberal states) are more likely than other states to impose HIV-testing restrictions. Measures of prevailing attitudes (ideology) appear to be the primary determinants of regulations prohibiting questions about sexual orientation, but economic interests are the primary determinants of mandated AIDS coverage.

1. Introduction

In 1981, when acquired immunodeficiency syndrome (AIDS) was formally classified as a disease, there were only 185 diagnosed cases in the United States. By 1988, there were over 47,000 diagnosed cases.[1] Recent estimates indicate that the number of diagnosed cases of AIDS will increase by 369,000 between 1988 and 1992. Each AIDS patient has been estimated to use about $30,000 to $60,000 of health care services related to AIDS during their lifetimes (Hellinger, 1988; Scitovsky, 1989). Total medical care costs for AIDS patients in the U.S. were about $2.6 billion in 1988, and are expected to increase to $7.5

billion (in 1988 dollars) by 1992 (Hellinger, 1988). These figures do not include significant medical care costs associated with AIDS-related complexes (ARC).

The AIDS epidemic has affected the U.S. insurance industry financially. Total AIDS-related insurance payments were about $1 billion in 1989, and are likely to rise with the projected increase in the number of persons with AIDS.[2] In response to the AIDS epidemic, many private health insurance companies have modified or considered modifying application procedures and policy coverages for individual health insurance policies (Eder et al., 1988). Overall, the modified underwriting practices make those with AIDS or those *actuarially likely* to contract AIDS medically uninsurable. Persons with AIDS without private insurance usually become the financial responsibility of the state through Medicaid.[3] Some states have adopted regulations designed to restrict the nature of modifications in health insurance contracts and underwriting practices related to AIDS.

Although the extent of state health insurance regulatory activity related to the AIDS epidemic is reasonably well documented (Colby and Baker, 1988; Faden and Kass, 1988; IHPP, 1987; Lewis, 1987), no one has systematically analyzed why states adopt particular types of regulation. We employ the economic theory of regulation to analyze state health insurance regulations related to AIDS. The AIDS-related regulations we analyze fall into two general areas. The first type involves regulatory limitations on the use of AIDS-related categorical risk information about individual applicants for health insurance in underwriting (specifically, HIV-seropositivity and sexual orientation). The second type involves regulations limiting AIDS-related modifications in standard insurance contracts (specifically, requiring health insurance policies to include coverage for AIDS). In our model, the likelihood that a particular state adopts an AIDS-related regulation is assumed to be associated with the political influence exerted by various interest groups within the state. Logistic regression analysis is used with state-level data to estimate the relationship between the presence of regulation and measures of interest groups' strength in the state, along with measures of prevailing attitudes among voters about the groups (general ideology and religious beliefs). The implications of the results are then discussed.

2. The regulatory issues in perspective

2.1. Categorical risk indicators and discrimination

Categorical information is often used by insurers as an indirect indicator of the risk of particular types of applicants. Categorical risk indicators are used to ameliorate adverse selection problems, given that the true nature of risk for

an applicant generally is not known and may be prohibitively costly for the insurer to determine. The use of indirect risk indicators thus reduces information and monitoring costs in insurance contracts. Because the categorization process is imperfect, however, some individuals are assessed to represent a level of risk higher than their true risk, while others are assessed to have risk lower than their true risk. This problem is generally referred to as "categorical" or "statistical" discrimination (e.g., Hammond and Shapiro, 1986).

In analyzing the economic implications of categorical discrimination in insurance markets, Crocker and Snow (1986) show that, in theory, costless categorical information concerning risk can unambiguously enhance allocative efficiency, in that the benefits to those gaining from categorization will always be sufficient to compensate those losing.[4] If categorization involves a non-trivial cost, the use of categorical risk indicators may be inefficient, in that the gainers may not achieve benefits (net of information costs) sufficient to compensate the losers (1986: 335–338). The likelihood that efficiency-reducing categorical discrimination will be employed in a competitive equilibrium decreases as the cost of categorization increases, because the costs of obtaining information will be more likely to exceed the net benefits captured by those involved in the exchange (1986: 338–339).[5]

2.2. Constraints on the use of categorical risk indicators

Insurers do not make use of all actuarially valid risk indicators due to a number of constraints that limit statistical discrimination. These constraints may take the form of informal (market) constraints or formal (regulatory) constraints imposed by the government. Market constraints consist of prevailing attitudes among market participants concerning the "fairness" of various business practices (e.g., Kahneman et al., 1986; Friedman and McGuire, 1989).[6] Formal regulatory constraints may result directly through legislation, administrative actions by regulatory agencies, or judicial action. These formal constraints also may be influenced by prevailing attitudes of "fairness" among voters. These prevailing attitudes may be more generally regarded as the ideological preferences of the voters which influence or constrain the behavior of those imposing the regulatory constraints. The influence of voter ideology most likely is greater for regulatory constraints imposed by the legislature or by regulatory commissions than for those imposed by the courts.

With respect to insurance, we suggest that prevailing attitudes about the "losers" and "winners" in categorical discrimination affect the nature of informal and formal constraints on the use of categorical risk information.[7] Attitudes regarding fairness may relate to the size and distribution of gains or losses across groups, perceptions regarding the losers' ability to bear losses,

the desirability of providing financial incentives to the individual for behavioral change, the costs of alternative means of risk assessment, and beliefs about the individual's responsibility for their categorical risk.[8] For example, the use of race as a categorical risk indicator for life expectancy may be considered "unfair" by some individuals because there is no potential for behavioral response (i.e., skin color cannot be changed) or because alternative risk indicators are available at a low cost (e.g., presence of hypertension). Another example of a categorical risk indicator for life insurance is the individual's use of tobacco. A risk premium for smokers provides an incentive for behavioral change (cessation of smoking). Individuals' attitudes about the "fairness" of such risk premiums are likely to be related to their assessments of the desirability or feasibility of behavioral response by those affected. An informal (market) constraint exists if insurers are reluctant to use an actuarially valid risk indicator because they perceive prevailing attitudes among their potential customers that the resulting statistical discrimination is "unfair." In other words, if the benefit to the insurer of using the risk indicator does not compensate for the resulting loss of "goodwill" the risk indicator will not be used. Attitudes among voters also may increase the likelihood that a formal regulatory constraint will emerge from the political market.

2.3. State regulatory constraints on health insurance

The first of the specific regulatory constraints on the use of categorical risk information we examine involves AIDS-related testing of applicants for individual health insurance policies. Employer-sponsored group health insurance is not directly affected by these regulations, and large self-insured employers are exempt from state insurance regulations under ERISA. However, employer-sponsored group health insurance is indirectly affected by anti-discrimination provisions concerning HIV-seropositivity in employment and promotion decisions and the provision of fringe benefits. For example, persons with AIDS or HIV-positive persons are regarded as handicapped under federal law (Annas et al., 1990). Pre-employment HIV-testing or HIV-testing of current employees generally is permitted only in very limited circumstances.[9] Together, these factors prevent routine HIV-testing of individuals who obtain health insurance through employment.

The specific tests relevant for the period in question are not tests for AIDS *per se*, but detect the presence of HIV antibodies, which indicate prior exposure to the AIDS virus. The most common HIV antibody test, the enzyme-linked immunosorbent assay (ELISA) test, is used primarily to screen blood and, accordingly, is highly sensitive (i.e., it has a very low false negative rate, but a high false positive rate). As a result of the sensitivity of the ELISA test, the

developing standard for HIV testing of individuals is a battery of tests including two ELISA tests followed by a "Western Blot" (WB) test. If all three are positive, the false positive rate is probably less than .1 percent (Clifford and Iuculano, 1987; Rhame and Maki, 1989), although the likelihood of a false-positive result may be related to some individual characteristics.[10] An individual who tests positive (i.e., is found to be seropositive) using the ELISA-ELISA-WB series has a 20 to 50 percent probability of developing AIDS within 6 to 10 years (Clifford and Iuculano, 1987).

We analyze two specific types of regulations concerning AIDS-related testing of insurance applicants: (1) prohibiting questions in the application process about any possible past HIV testing; and (2) prohibiting insurers from requiring insurance applicants to submit to HIV antibody tests. By 1988, 12 states had in place some variation of the first type of regulation, and 7 states some variation of the second type (Faden and Kass, 1988). The usefulness of direct information from HIV tests in underwriting is obvious. Questions concerning past testing are also useful to insurers, in that false responses to such questions by an applicant can be used to invoke preexisting-condition clauses or to void the insurance contract completely upon the onset of AIDS.

It is reasonable to assume that the statistical association between seropositivity and AIDS has some causal basis, in that they are linearly sequential physiologically. The actuarial basis for employing seropositivity in underwriting is as strong or stronger than many other generally used and accepted risk indicators, such as risk premiums for smokers versus non-smokers (Clifford and Iuculano, 1987). Prohibiting insurers from using seropositivity, when such information is available to the insured, is likely to exacerbate adverse selection problems (Hammond and Shapiro, 1986).

Opponents of HIV-testing, on the other hand, cite several reasons to label as "unfair" the use of HIV-test-related information about health insurance applicants. The first is the potential for promoting discrimination against homosexuals or others in high risk groups (Blendon and Donelan, 1988; Hiam, 1987; Scherzer, 1987; Vogel, 1989). Another concern is that mandatory testing of applicants or using questions about testing may discourage high risk individuals from volunteering for testing, and that the resulting reduction in access to knowledge concerning their prior exposure to the AIDS virus may contribute to their likelihood of spreading the disease (Schatz, 1987). A third objection is that, because the available tests do not detect AIDS, rejecting applicants who are seropositive but asymptomatic is intrinsically unfair, because they do not have a disease (Schatz, 1987; Scherzer, 1987; Vogel, 1989).

The third regulation we analyze is intended to prohibit health insurance companies from asking applicants questions designed to determine their sexual orientations. By 1988, 22 states had some variation of this regulation in place (Faden and Kass, 1988). The concern motivating these prohibitions is that allowing

such "life style" questions will contribute to discrimination against homosexuals (Schatz, 1987). Another justification is that information about sexual orientation is difficult to verify and provides little useful information for health insurance underwriting purposes. Indeed, the Health Insurance Association of America (HIAA) discourages insurance companies from using such questions because of the limited actuarial validity of sexual orientation (Eder et al., 1988). Nonetheless, about 30 percent of commercial health insurers obtain information concerning the sexual orientation of applicants – although most of these give such information little weight in underwriting risk (Eder et al., 1988).

The final regulation is intended to prevent one possible response of private insurers to the increased health care costs associated with AIDS – simply excluding any costs attributable to AIDS from the services covered by a health insurance contract. By reducing adverse selection problems, this type of contract modification may increase the access of those perceived to be at risk for developing AIDS to health insurance coverage for unrelated illness. If this exclusion were pervasive in private health insurance contracts, the cost of treating AIDS would be, in effect, transferred from the private sector to the public sector through Medicaid.[11] There is little evidence that such exclusions are used at present, and less than 10 percent of insurers are considering these exclusions in future policies (Eder et al., 1988). Nonetheless, by 1988, 16 states had in place regulations prohibiting the exclusion of AIDS from covered services (Faden and Kass, 1988).[12]

3. Empirical model

Our empirical model is based on Gary Becker's (1983) model of interest-group competition for political influence as it relates to the economic theory of regulation (Finsinger and Pauly, 1986; McChesney, 1987; Peltzman, 1976). In Becker's model, a particular interest group's political influence is affected by their own efforts to produce political pressure, the efforts of competing groups, and other factors (e.g., in this case, prevailing attitudes among voters concerning the interest group or the interest group's objectives for influence).[13] The amount of pressure produced by the group depends in part on the amount of resources employed by the group, the size of the group, and the efficiency with which the group transforms resources into pressure.[14] The prevailing attitudes or ideology of the voters thus may be regarded as a "technological factor" in the production of political influence.[15]

Interest groups use political influence to alter the nature of taxes or subsidies affecting the group. Taxes and subsidies refer to both direct taxes or subsidies and "implicit" taxes or subsidies – actions that indirectly impose costs or give

benefits to a group (e.g., regulatory restrictions on entry into an industry). Competition among interest groups for taxes and subsidies may be a negative-sum game (because of dead-weight costs), but political influence is a zero-sum game, in that increased influence by one interest group necessarily implies diminished influence by another group (Becker, 1983: 376).

AIDS-related insurance regulations may be viewed as creating implicit taxes and subsidies affecting certain interest groups. Affected interest groups are likely to employ a variety of resources in an effort to influence insurance regulations. This influence, consequently, affects the size of implicit taxes or subsidies accruing to the groups. Prevailing attitudes among voters toward the interest groups producing political pressure may affect the extent of influence created by the groups' political pressure. The extent of competition within the state government for decision making authority also may affect the extent of influence produced.

Interest groups implicitly taxed by AIDS-related insurance regulations include: private health insurance companies (because regulation is likely to reduce their producers' surplus); and private insurance policy holders with much less than average risk for AIDS (because regulation is likely to increase their premium cost, thereby reducing their consumers' surplus). These regulations provide an implicit subsidy for several interest groups including: those at risk for AIDS (because it is likely to reduce their premium cost, thereby increasing their consumers' surplus); and private providers of health care services (because patients with private insurance generally provide more generous compensation for services than those with only Medicaid coverage or no insurance at all).

Politicians within state governments also may benefit from these regulations, if financing the health care of AIDS patients by increasing implicit taxes through regulation is less politically costly to the politicians than raising explicit taxes to finance care directly through Medicaid.

In our empirical model, we use logistic regression analysis to estimate the likelihood of regulation for the four regulations described above:

$$R_i = f(I_t, I_s, M, C, A).$$

R_i is a dichotomous variable indicating the presence of the i*th* regulation, I_t is a set of measures of the political power of interest groups implicitly taxed by regulation, and I_s is a measure of the political power of groups implicitly subsidized by regulation. The likelihood of regulation is also presumed to be related to the importance of Medicaid in the state government's budget (M), the extent of competition for decision making authority within the state government (C), and prevailing attitudes among voters (A) about interest groups affected by AIDS-related regulation (e.g., homosexuals).

Most of the variables in Becker's political pressure production functions are

not easily observed, even under ideal conditions. Rough proxies for the theoretical variables are used in our empirical analysis to capture the extent of political pressure produced by interest groups.

The cumulative number of diagnosed AIDS cases per 100,000 population within the state is employed as a proxy for the size of the group most directly affected by regulation. This measure, however, also relates to the fundamental importance of AIDS-related regulatory issues to other interest groups, at least in the short run. As the prevalence of AIDS increases, the resources within the state devoted to producing pressure for regulations that provide implicit subsidies to those at above-average risk for AIDS are presumed to rise. The likelihood of regulation thus is expected to increase as AIDS rates increase.[16]

Measuring insurance industry strength (one of the interests implicitly taxed) is problematic. Neither state-level health insurance premium revenue data nor measures of within-state insurance industry concentration exist.[17] Given data limitations, our measure of insurance industry strength is the percentage of civilian employment in finance, insurance, and real estate within the state. As this percentage increases, the production of political pressure by the insurance industry is presumed to increase and, thus, the likelihood of observing regulation is expected to decrease, *ceteris paribus*. The political power of private insurance policy holders at below average risk for AIDS also is quite difficult to measure precisely. The measure we use is the percentage of the population with health insurance other than Medicare or Medicaid. As this percentage increases, regulation may be less likely, if those affected can overcome free-rider problems in the production of political pressure.

The political pressure produced by health services provider interest groups implicitly subsidized by regulation is measured using several variables, none of which are ideal proxy measures. Hospital interest group effects are proxied by "uncompensated care" costs per hospital bed. These are costs hospitals incur by providing services to patients without insurance who are unable to pay for care.[18] Physicians interests are measured in terms of the physician-population ratio. This may be a very poor measure, however, as most physicians have very little to do with persons with AIDS (Rizzo et al., 1990). Regulation is expected to be more likely in states as these measures of the power of provider interest groups increase.

The importance of Medicaid to the state government's finances is proxied by Medicaid's share in the overall state budget. Because Medicaid expenditures are also determined through public choice, we use an instrumental variable for the observed Medicaid budget share in our empirical analysis.[19] If financing the health care of persons with AIDS through implicit taxes (regulation) is less politically costly than financing care directly through Medicaid, regulation may be more likely as the Medicaid budget share increases.

Prevailing attitudes among likely voters cannot be measured directly. We use

two indirect measures of attitudes among voters about affected interest groups. The first is termed "general liberalism" and is measured as the average of the ratings of the voting records (on a scale of 0 to 100) of Congressmen from the state by the Americans for Democratic Action (ADA) and the AFL-CIOs Committee on Political Education (COPE).[20] A higher value of the index is assumed to be associated with greater liberalism among likely voters.[21] Liberal states may be more likely to impose formal regulatory constraints on the freedom of contract between insurers and applicants. Moreover, as Replogle (1988) notes, liberals are less likely than others to view sexual orientation as subject to individual choice. This may translate into an attitude that persons with AIDS are not responsible for the sexual risk behaviors associated with the disease. Liberalism is presumed to increase the effectiveness of political pressure by AIDS interest groups relative to that of insurance interest groups. Thus, regulation is expected to be more likely in liberal states.

The second measure is the percentage of the population adhering to "fundamentalist" Protestant religions, including Baptists, Nazarenes, and Mormons.[22] The link between fundamentalist religious beliefs and attitudes such as intolerance has been well established in previous work (Acock et al., 1981; Christenson et al., 1984; Greenberg and Bystryn, 1982; Rokeach, 1973), as is the link between these attitudes and political activism (Colombo, 1984; Scott and Schuman, 1988; Wilcox, 1988). Individuals in more fundamentalist states may be less compassionate toward persons with AIDS, or less tolerant of homosexuals than those in other states.[23] Political pressure exerted by AIDS interest groups may be less effectively transformed into political influence in such states. Fundamentalist states thus are expected to be less likely to adopt regulations of this type.

However, the strong negative correlation between these variables does not allow both to be included in the model as separate independent variables. We use the ratio of the liberalism and fundamentalism measures as an index of prevailing attitudes among voters. To make the two measures within the ratio more comparable in scale, each is normalized to lie on a [0, 1] interval by dividing the value of each measure for all observations by the maximum value of the measure in the sample.

The extent of competition for decision making authority also is difficult to capture. We use a measure of interparty competition derived from a Ranney (1976) index Democratic party control within the state government in the model. The index has a maximum value of 50 and a minimum value of 0 (in the case of either complete Democratic or complete Republican control). This measure is far from ideal, particularly for southern states. The theoretical effect of competition on the regulatory outcome is ambiguous, but the general notion is that competition increases the likelihood of growth in visible subsidies or govern-benefits and reduces the likelihood of broad-based tax increases. This would

suggest that greater competition would be associated with a greater likelihood of regulation.

4. Results

We use state-level data for the presence of regulation pooled over 1986–88 to estimate the model.[24] All monetary data are deflated by a state-level price index (1972 = 1). The independent variables are lagged one year in time (e.g., the presence of regulation in 1988 is hypothesized to be related to the values of the independent variables in 1987, etc.).[25] Due to the high degree of multicollinearity among the independent variables (see Appendix B) and the imperfect nature of the proxy measures employed, several alternative model specifications are estimated to determine the robustness of the results.[26] The logistic regression results, presented in Table 1, are expressed in terms of the estimated "response elasticities" for each of the independent variables for the probability of regulation. Response elasticities are calculated at sample means as $E_i = (\partial P/\partial X_i)(X_i/P)$, where $\partial P/\partial X_i = b_i P (1 - P)$, b_i is the estimated logit coefficient for X_i and P is the predicted probability of the presence of regulation (Hanushek and Quigley, 1977: Ch. 7). The "pseudo-R^2" for the logistic regressions are also reported.[27]

4.1. HIV-testing

With respect to our analysis of regulations prohibiting questions regarding past HIV testing (REG1, columns 1–3), a 1 percent increase in AIDS cases per 100,000 population is associated with about a .4 to .7 percent increase in the probability of questions about testing, holding other variables in the model constant ($p < .05$).[28] The effect of insurance employment share is negative, as expected, and statistically significant ($p < .05$). The point estimate of the response elasticity is very large, suggesting that regulators are highly responsive to insurance industry interests. The magnitude of the response elasticity, however, is very sensitive to specification choices. Perhaps this relates to the fact that this may be a rather poor measure of the political strength of the insurance industry in a state. The percentage of the population with private insurance, when included in the model, also has a negative elasticity estimate, but it is not statistically significant.

Hospital uncompensated care cost per bed, as a proxy for the interests of hospitals within the state, is positively associated with regulation, as expected, but the effect is not statistically significant.[29] In terms of physician interests,

Table 1. Estimated effects of interest groups and ideology on probability of regulation of HIV-testing, sexual orientation, and AIDS coverage: 1986–88

Response elasticities[a]	REG1	REG1	REG1	REG2	REG2	REG2	REG3	REG3	REG3	REG4	REG4	REG4
Cumulative AIDS cases per 100,000 populations	.676 (.048)[b]	.408 (.002)	.446 (<.001)	.945 (.042)	.510 (.002)	.545 (<.001)	.098 (.963)	.036 (.417)	.038 (.383)	.588 (.035)	.292 (.002)	.325 (<.001)
Insurance-related employment share	-3.631 (<.001)	-2.702 (.043)	-4.204 (.008)	-4.996 (<.001)	-3.673 (.021)	-3.856 (.001)	-1.201 (.057)	-.286 (.521)	-.328 (.455)	-3.770 (.002)	-1.656 (.010)	-1.871 (.003)
Percent of population with private insurance	-.183 (.174)	–	–	-.277 (.140)	–	–	.679 (.873)	–	–	-1.996 (.713)	–	–
Real uncompensated care costs per hospital bed	1.027 (.132)	.804 (.326)	.065 (.912)	1.553 (.067)	1.021 (.292)	.249 (.691)	1.123 (.074)	3.194 (.208)	3.161 (.291)	.980 (.113)	3.337 (.218)	1.476 (.704)
Patient-care physicians per 1000 population	1.742 (.150)	–	–	2.312 (.175)	–	–	2.719 (.109)	–	–	3.694 (.233)	–	–
State medicaid budget-share[c]	-1.453 (.131)	-1.009 (.388)	-1.430 (.319)	-1.812 (.219)	-1.396 (.303)	-1.390 (.191)	-.610 (.020)	-1.052 (.027)	-1.019 (.030)	1.819 (.049)	2.948 (<.001)	2.939 (<.001)
Interparty competition	6.263 (<.001)	1.542 (.083)	–	8.076 (.001)	1.614 (.122)	–	.947 (.157)	.222 (.477)	–	2.002 (.008)	.909 (.021)	–
Liberalism/fundamentalism	.632 (0.54)	.464 (.037)	.485 (.010)	1.059 (.062)	.525 (.048)	.561 (.006)	.507 (.019)	.400 (<.001)	.394 (<.001)	-.079 (.737)	.028 (.774)	.016 (.863)
Pseudo R^2	.403	.366	.352	.422	.414	.407	.124	.098	.105	.350	.325	.307
Likelihood ratio (χ^2)	101.106	94.900	82.735	102.563	98.798	92.479	40.305	34.212	31.756	83.641	79.446	73.585

Dependent variables: REG1 = prohibit questions about past HIV tests; REG2 = prohibit requiring HIV test; REG3 = prohibit questions about sexual orientation; REG4 = mandate AIDS coverage in insurance policies.

[a] Response elasticities are calculated at sample means as $E_i = (\partial P/\partial X_i)(X_i/P)$, where $\partial P/\partial X_i = b_i P (1 - P)$, is the estimated logit coefficient for X_i and P is the predicted probability of the presence of regulation. An intercept term is included in the logistic regression (its elasticity is zero by definition).

[b] Number in parentheses is the p-value for a two-tailed test.

[c] Instrumental variable, as described in text.

Sources: see text.

the physician-population ratio is positive but not statistically significant.[30]. The lack of provider interest group effects on HIV-testing regulations may simply reflect the inherent limitations of our proxy measures for their political power within the state. In the case of physicians, however, this result may not be surprising, as the AIDS epidemic probably has very little financial impact on most physicians (e.g., Rizzo et al., 1990).

Our instrument for the state's Medicaid budget share is negatively associated with the likelihood of this regulation, contrary to our expectations, but the effect is not statistically significant. Greater interparty competition within the state government is associated with a higher probability of regulation, but the magnitude and statistical significance of its effect is highly sensitive to specification choices.

With regard to the effects of voter ideology, the results are as expected. A 1 percent increase in the relative liberalism-fundamentalism index is associated with about a .5 to .6 percent increase in the probability of this prohibition (p < .05). In more liberal states, interest group pressure in favor of such regulation may translate into more political influence, relative to that produced with equal resources in conservative states. Another possibility is that, given the lack of measures of legislator or regulator ideology in the model, this result in part reflects ideological behavior on the part of regulators.

Our findings with respect to regulations prohibiting HIV testing of health insurance applicants (REG2, columns 4–6) generally are quite similar to the results for prohibiting questions about past HIV testing. AIDS prevalence increases the likelihood of an HIV-test ban. Insurance employment has a negative effect on the probability of regulation. A 1 percent increase in insurance industry employment share is associated with a 4 to 5 percent decrease in the probability of regulation. The magnitude of this response elasticity is less sensitive to specification choices than was the case for REG1. Hospital and state Medicaid interests again have no statistically significant effect. A 1 percent increase in liberalism relative to fundamentalism increases the estimated probability of regulation by about .5 percent (p < .05), but the effect is statistically significant only in the more limited model specifications.

4.2. Sexual orientation

For the regulation prohibiting questions about sexual orientation (REG3, columns 7–9), the ability of the model to predict the presence of regulation is substantially lower than for the HIV testing regulations. The overall pseudo-R^2 for the model is low — at best .12, compared to about .40 in the models for HIV testing issues.

The estimated effect of AIDS prevalence on the probability of regulation is

negative, but not statistically significant. When gay lobby strength is included in the model in place of AIDS prevalence (results not reported here), it has a *negative* and statistically significant effect on the probability of regulation, contrary to our expectations. Insurance employment, the percent insured population, uncompensated care costs, and physician interests also are not statistically significant. The states' Medicaid budget share is negatively associated with the probability of regulation, contrary to our expectations. Voter ideology, overall, has the most consistent predictive ability for this regulation. A 1 percent increase in liberalism relative to fundamentalism is associated with about a .4 to .5 percent increase in the probability of regulation ($p < .05$). This effect is highly robust with respect to changes in the specification of the model.

The inconsistent and weak results for variables other than ideology may reflect, to some degree, the HIAA recommendation against using questions about sexual orientation in the application process. Sexual orientation *per se* is not a strong predictor of risk, and is difficult to verify (Schatz, 1987). As such, it is difficult to use such information for underwriting purposes. Moreover, as Crocker and Snow's (1986) model would predict, most insurers do not use information on sexual orientation. Even those who use such information indicate that it is a relatively unimportant factor in rating risk (Eder et al., 1988). Thus, the effect of this regulation may be more symbolic than substantive. It also could be argued that this regulation involves a fundamental issue of individual privacy, and is less directly related to AIDS than the regulations concerning HIV testing. Perhaps the nature of the issue explains in part why variables such as AIDS prevalence have no significant association with this particular regulation.

4.3. Excluding AIDS from coverage

Our findings with respect to prohibiting the exclusion of AIDS from covered services (REG4, columns 10–12) suggest that the prevalence of AIDS is a strong predictor for the presence of regulation, as is insurance employment. The overall predictive ability of the model is comparable to the HIV testing regressions, in terms of the pseudo-R^2. A 1 percent increase in AIDS cases per 100,000 is associated with about a .3 to .6 percent increase in the probability of regulation. The magnitude of the insurance employment share effect is more sensitive to specification choice (the estimated response elasticity ranges from about 1.7 to 3.8). Regulators also appear to be very responsive to state Medicaid interests, with a 1 percent increase in the Medicaid budget share associated with about a 2 to 3 percent increase in the probability of regulation.

In contrast to the HIV testing results, our indicator of voter ideology is a poor predictor for the AIDS mandate regulation. Recall, however, that virtual-

ly no insurers at present exclude AIDS from coverage, and few are considering such exclusions. It should be noted that an overwhelming majority of Americans (87%) oppose discrimination in access to health care services for persons with AIDS (Blendon and Donelan, 1988). This particular regulation appears to be, at least at present, more symbolic than substantive, as these pervasive attitudes within the population apparently provide a sufficient informal market constraint. Nonetheless, the financial impact of such a mandate could become enormous as the prevalence of AIDS continues to grow. This may explain why insurance interest groups effects are apparent for the AIDS coverage mandate regulations despite the fact that the regulatory constraint does not appear to be binding at present.

4.4. Implications for the future

In our empirical analysis, we have treated voter attitudes within a state as fixed and exogenously determined. In the long run, however, attitudes may change directly as the result of efforts by interest groups to alter beliefs, or indirectly by seemingly unrelated educational initiatives. Efforts by gay-rights activists, for example, have slowly affected changes in prevailing attitudes about homosexuality (Bullert, 1987). In effect, according to Bullert, gays increased their political influence by instilling beliefs that sexual orientation is pre-determined rather than chosen by the individual (behavioral change is not possible), and that homosexuality is a normal behavior that harms no one (behavioral change is not necessary or desirable). Thus, gays aligned themselves with the civil rights movement, tapping into strong prevailing attitudes of fairness. In other words, if prevailing beliefs are that sexual orientation, like skin color, cannot and should not be changed, categorical discrimination detrimental to gays is likely to be constrained by market forces or formal regulatory action.

Some public policy initiatives not related to insurance issues, such as AIDS education programs, not only affect individuals' knowledge about AIDS, but also tend to increase support for coercive measures to control AIDS (Allard, 1989). In effect, as individuals become more informed about specific risk behaviors for AIDS, they become more able to accurately assess their own risk. If their risk is extremely low, they may be more willing to support coercive measures that will only directly affect those with higher risk. The increased support for coercive measures may reflect increased hostility among those increasingly aware of their own low risk toward persons with AIDS. That is, AIDS education may increase the perceived responsibility of persons with AIDS for their disease.

In the long run, the extent to which AIDS-related regulations are binding

may ultimately depend upon attitudes within the judiciary. Regulations prohibiting HIV-testing have been challenged in most of the states with these regulations, with mixed results. For example, in *American Council of Life Insurance* v. *District of Columbia*, a law prohibiting the use of HIV-tests in underwriting in D.C. was narrowly upheld by the Federal District Court for the District of Columbia.[31] But similar regulations in Massachusetts and New York were struck down.[32] In Oregon, a self-insured company's exclusion of AIDS from employee group health benefits was ruled to be discriminatory because it disproportionately affected males.[33] But a similar action by a Texas employer was not regarded as unlawful by a U.S. District Court.[34] The legal environment for AIDS-related insurance regulation is currently evolving. It is likely to take several years for the issues to become more settled.

5. Conclusion

The presence of regulations within a state restricting AIDS-related health insurance underwriting practices is related to the nature of interest group pressure and political influence. AIDS prevalence rates and indicators of voter attitudes about persons with AIDS appear to be strong predictors of AIDS-related regulation. Insurance industry strength within a state reduces the likelihood of regulations that significantly constrain underwriting practices. Measures of health care provider interests and state government interests are inconsistent in terms of their association with regulation. Both prevailing attitudes (ideology) about persons with AIDS and economic interest group strength appear to affect HIV-testing regulations, but economic interests appear to dominate attitudes for regulations mandating AIDS coverage.

It is unknown to what extent these findings, based on indirect indicators of voter attitudes, reflect a more direct relationship between individual voter attitudes and the climate for regulation. An interesting issue for future research is to examine the relationship between individual attitudes and the demand for regulation more directly. Public health policies, such as AIDS education programs, to the extent they change knowledge, may affect individual attitudes and, consequently, the political climate for health insurance regulation.

Proponents of these health insurance regulations also should be aware of the "unintended" (but predictable) consequences of regulation. Restrictions on the use of HIV-seropositivity in underwriting health insurance may cause insurers to use less reliable or more costly indicators of risk. In fact, most insurance companies in states prohibiting HIV-testing use alternative means of assessing risk, such as a "T-Cell" test or an attending physicians statement related to symptoms of AIDS (Eder, et al., 1988). Regulations may increase the prevalence of AIDS within states with more protective AIDS-related regula-

tions, if seropositive individuals relocate to these states to benefit from protective regulation. In the long run, as the financial impact of the AIDS epidemic increases, some insurers may respond to strict regulatory limits on the use HIV-test information by withdrawing from the market completely. This would reduce overall access to private insurance markets in the state, thereby increasing the number of uninsured persons and the state's Medicaid responsibilities. The costs of these unintended consequences should be weighed against any gains in perceived "fairness" related to these regulations.

Notes

1. These data are from *Mortality and Morbidity Weekly Report*, Centers for Disease Control, various issues.
2. The data for AIDS-related claims are from the American Council of Life Insurance and the Health Insurance Association of America, as quoted in *Medical Benefits* 7(22), 30 Nov., 1990: 1.
3. Pascal (1987) estimates that as many as 60 percent of all AIDS patients eventually become Medicaid recipients. He estimates that AIDS-related expenditures will account for about 3 percent of total Medicaid expenditures over the period 1986–1991. This figure is much higher for states with a relatively high prevalence of AIDS.
4. Attainment of efficiency gains in Crocker and Snow's model, however, requires the use of risk-based taxes on policies to facilitate transfers between winners and losers. A competitive market equilibrium with categorical discrimination based on costless categorical information may or may not attain a Pareto efficient allocation (1986: 331–335).
5. It does not follow, however, that regulatory prohibitions on the use of categorical information will unambiguously enhance efficiency (Crocker and Snow, 1986: 338–339).
6. The market fairness constraints that emerge over time, according to Friedman and McGuire (1989), will tend to be those that enhance efficiency (e.g., fairness constraints on the use of market power).
7. For a similar argument in a different context, see Zajac (1985). He argues that the fact that a reallocation has a positive sum (winners gain more than losers lose) is irrelevant unless full compensation to the losers actually occurs. Otherwise, potential Pareto improving reallocations are likely to be viewed as if they were zero-sum transfers, with the perceived fairness of these "transfers" related to attitudes about the winners and losers.
8. Hoffman and Spitzer (1985) find, for example, that attitudes about an individual's responsibility for the basis used to distribute income affect the perceived justice of the resulting distribution. In their experiment, a coin flip allocated a property right. Those who won the property right usually refused to fully exploit it, choosing instead to share income equally. Random allocation of this property right apparently was considered unfair by many individuals, even ex post by those who won the rights.
9. See, for example, *Glover v. Eastern Nebraska Community Office of Retardation* [686 F. Supp. 243 (D. Neb. 1988), *aff'd*, 867 F.2d 461, 4 IER Cases (BNA) 65 (8th Cir. 1989)] and *Kevin Leckelt v. Board of Commissioners of Hospital District No. 1* [714 F. Supp 1377 (E.D. La. 1989), 49 Fair Empl. Prac. Cas. (BNA) 541, 49 Empl Prac. Dec. (CCH) P38,900, 13 OSHC (BNA) 2086 (1989)]. These cases suggest that HIV testing is unambiguously permitted only if the employee is known to have been exposed to the AIDS virus and if the seropositivity of the employee is relevant with respect to the performance of the employee's duties.
10. Specifically, false positive rates are higher among multiparous women (i.e., those who have

had more than one child) and among individuals with a history of malaria (Farg et al., 1986).

11. We do not mean to imply that this provides an efficiency justification for this type of regulation, nor do we intend to suggest that such an outcome is either desirable or undesirable. It is merely a statement of fact given the existing structure of health insurance in the United States.

12. Overall, by 1988, 23 states had in place none of the four regulations discussed here, 10 states had only one of the four regulations, 8 had two of four, 5 had three of four, and 4 states had all four of these regulatons.

13. Becker does not discuss this particular case explicitly, but mentions it only in passing (1983: 394). In the long run, attitudes and pressure may be related, if part of the group's effort entails "educating" the public (Bullert, 1987).

14. Because free-rider problems tend to reduce the marginal product of resources as group size increases, the efficiency of pressure production increases as the group's effectiveness in policing free-riders increases *relative* to that in competing groups.

15. The role of *legislator* ideology has received considerable attention in the public choice literature (Kalt and Zupan, 1990). Although voters may not be ideologists in general (Glazer and Grofman, 1989), they may have intense ideological preferences on specific issues (such as abortion) not directly related to any pecuniary interest (Gohmann and Ohsfeldt, 1990; Medoff, 1989; Vinovskis, 1979). Moreover, unless regulators are systematically more liberal (or more conservative) than their constituents, legislator ideology will tend to "wash out" in terms of its effects on the outcome of the choice process.

16. Gay rights groups have been particularly active in pursuing regulatory measures beneficial to those with AIDS. As an alternative to the AIDS rate, we used a measure of the strength of gay rights lobbies (the number of formal gay organizations within the state per 1,000,000 population). The number of gay organizations in 1987 ranged from zero (North Dakota) to 153 (California). The number of organizations rather than the size of their membership is obviously an imperfect proxy for the political strength of the gay population. The results using this measure in the model in place of the AIDS rate variable were very similar to those using the AIDS rate, with the exception of the regulation concerning sexual orientation.

17. Personal communication, Jon Gabel, Health Insurance Association of America, February 1989.

18. An alternative measure of hospital interests (total hospital costs per bed) produced results similar to those reported in the paper.

19. The instrument is obtained from an OLS regression of state-only Medicaid expenditures on an index of liberalism, an index of interparty political competition within the state government, real per capita personal income, the federal medical assistance percentage, percent non-white population, and the physician population ratio. The motivation for the specification of this regression is described in studies of Medicaid expenditures (e.g., Holohan and Cohen, 1986).

20. These ratings were obtained from Barone (1988) and directly from the ADA. For those states with only one Representative, the average also includes the ratings of the state's Senators.

21. Note that this is intended to refer to the ideology of the voters, not the political decision maker. The use of this index is based on the presumption that the ideological preferences of elected officials at least broadly reflects that of their voting constituencies.

22. These data are obtained from Quinn et al. (1982) for adherents as of 1980. More recent adherent data at the state level are not readily available. The classification system used to define fundamentalist denominations is described in Smith (1990).

23. Alternatively, fundamentalists could be viewed as a particularly active component of another interest group – individuals at below-average risk for AIDS who are implicitly taxed by these regulations (if, unlike Jimmy Swaggart, fundamentalists practice what they preach). But it is

reasonable to assert that their activism is more directly motivated by their beliefs than by the (generally quite small) pecuniary effects of the implicit tax, net of the reduction in the average taxpayer's Medicaid tax burden.

24. See Appendix A for the means and coefficients of variation for the variables used.
25. Exceptions are gay lobby strength (1987 level), fundamentalism (1980 level), and percent privately insured population (1986 level), which are given the same value in all years.
26. To conserve space, other model results not explicitly reported are discussed where appropriate.
27. See Maddala (1983: 39–41) for a discussion of pseudo-R^2 measures.
28. Gay lobby strength, when included in the model as a substitute for the AIDS prevalence variable, is also positive and statistically significant (results not reported here).
29. Total hospital expenses per bed, as a substitute proxy, also is never statistically significant (results not reported).
30. The state medical society membership rate, as an alternative measure of physician interest group strength, is usually negatively associated with regulation, but the effect generally is not statistically significant (results not reported).
31. 645 F. Supp. 84 (D.C. 1986). The effect of this decision on insurers in D.C., however, was removed shortly thereafter by Congressional action.
32. *Life Insurance Association of Massachusetts v. Commissioner of Insurance*, 403 Mass. 410, 530 N.E.2d 168 (1988); and *Health Insurance Association of America v. Corcoran*, 154 A.D.2d 61, 551 N.Y.S.2d 615 (1990), *aff'd*, No. 260, Court of Appeals of New York (Dec. 18, 1990).
33. *Oregon Civil Rights Division v. Beaverton Nissan*. Case cited in *AIDS Update 2* (March 1988): 4. It should be noted that this was an administrative ruling; the case as of yet has not been adjudicated.
34. *McCann v. H. & H Music Co.*, 742 F.Supp. 392 (S.D. Tex. 1990).

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Appendix A: Weighted means and coefficients of variation for model variables, 1986–88

Variable	Overall sample	States with any regulation	States with no regulation
REG1	.233[a]	.394	–
	(1.828)[b]	(.704)	
REG2	.210	.370	–
	(1.904)	(.671)	
REG3	.377	.634	–
	(1.288)	(.866)	
REG4	.432	.717	–
	(1.148)	(.717)	
AIDS prevalence rate	10.583	14.838	4.447
	(1.255)	(1.196)	(.775)
Insurance employment	6.171	6.525	5.660
	(2.225)	(.245)	(.180)
Insurance population (%)	84.641	85.686	83.133
	(.049)	(.048)	(.045)
Hospital uncompensated care	7.139	6.809	7.614
	(.354)	(.397)	(.293)
MDs per 1000 population	1.630	1.821	1.353
	(.262)	(.261)	(.164)
Medicaid budget share	8.850	9.571	7.811
	(.215)	(.228)	(.147)
Interparty competition	35.532	38.689	30.980
	(.302)	(.279)	(.301)
Liberal/fundamental index	10.637	15.323	3.921
	(.987)	(.806)	(1.076)
N	150	69	81

[a] Sample mean, weighted by relative size of state population.
[b] Coefficient of variation is the standard deviation divided by the sample mean.
Source: see text.

Appendex B: Correlation matrix for independent variables

	AIDSPC	GAYSPC	INSEMP	INSPOP	RHEXPPB	RUNCPB	MDPOP	MCXSGXH	PRTYCMP	LIBFUND
AIDSPC	1.00000									
GAYSPC	0.44553	1.00000								
INSEMP	0.71219	0.35408	1.00000							
INSPOP	-0.02662	0.01254	0.26545	1.00000						
RHEXPPB	0.27298	-0.10453	0.27315	0.12350	1.00000					
RUNCPB	-0.06039	-0.37718	-0.12973	-0.35255	0.32481	1.00000				
MDPOP	0.50028	0.32106	0.63927	0.48997	0.10453	-0.27237	1.00000			
MCXSGXH	0.62858	0.48202	0.45070	0.19744	0.14537	-0.25241	0.73655	1.00000		
PRTYCMP	0.20557	0.20271	0.17531	0.32975	0.12640	-0.57683	0.18601	0.29711	1.00000	
LIBFUND	0.36160	0.45858	0.48747	0.60538	0.01023	-0.50300	0.62017	0.51551	0.36096	1.00000