

Special Article

STATE EXPENDITURES FOR TOBACCO-CONTROL PROGRAMS
AND THE TOBACCO SETTLEMENT

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ABSTRACT

Background Despite controversy surrounding the use of funds arising from settlement agreements with the tobacco industry, little is known about the role of these funds in expenditures for state tobacco-control programs.

Methods We evaluated state expenditures for tobacco-control programs in fiscal year 2001 in the context of the amount of tobacco-settlement funds received and allocated to tobacco-control programs and in the context of other state-level economic and health data.

Results In 2001 the average state received \$28.35 per capita from the tobacco settlement but allocated approximately 6 percent of these funds to tobacco-control programs. The average state dedicated \$3.49 per capita (range, \$0.10 to \$15.47) to tobacco-control programs. The proportion of settlement funds allocated to tobacco-control programs varied from 0 to 100 percent and was strongly related to levels of tobacco-control funding ($P < 0.001$). States with higher smoking rates tended to invest less per capita in tobacco-control programs ($P = 0.007$), as did tobacco-producing states (the mean per capita expenditure was \$1.20, as compared with \$3.81 in non-tobacco-producing states; $P < 0.008$). In a multivariate analysis, the proportion of the settlement revenue allocated to tobacco-control programs was the primary determinant of the level of total funding; the state tobacco-related health burden was unrelated to program funding.

Conclusions State health needs appear to have little effect on the funding of state tobacco-control programs. Because only a very small proportion of the tobacco settlement is being used for tobacco-control programs, the settlement represents an unrealized opportunity to reduce morbidity and mortality from smoking. (N Engl J Med 2002;347:1080-6.)

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IT has been four years since the tobacco industry reached settlement agreements with all 50 states, and it has been suggested that the settlement is not living up to its promise.¹ Despite the newly imposed marketing restrictions, the 24 percent increase in marketing expenditures by the tobacco industry in the year after the settlement (to a total of \$8.24 billion) was the highest ever reported.² There

has been no significant decrease in youth-directed magazine advertisements.^{3,4} Paradoxically, the tobacco industry continues to enjoy increasing revenues: although the price of cigarettes increased by up to 50 percent in the two years after the settlement, cigarette sales decreased by only about 10 percent in the same period.^{2,5}

The primary goal of the settlement, however, has been described as promoting public health rather than punishing the tobacco industry.⁶ In fact, the Master Settlement Agreement specifically states that one of the goals for the agreement was to support "tobacco related public health measures."⁷ As a result, it was hoped that the states would invest a considerable proportion of their settlement revenue in comprehensive tobacco-control programs. Several studies indicate that over the past decade, states with such programs had a decline in cigarette consumption that was significantly greater than the national average.⁸⁻¹⁰ It has been estimated that the California program alone has saved more than 33,000 lives since its inception.⁸ The Centers for Disease Control and Prevention (CDC) performed an evidence-based analysis of successful state tobacco-control programs and issued a minimal funding recommendation for each state.¹¹ These recommendations, which are based on the smoking rate and the population age distribution of each state, range from about \$5 to \$15 per capita.¹¹

The allocation of the settlement funds by state legislatures has been closely scrutinized. Recent data suggest that only a small proportion of the settlement has been devoted to tobacco-control programs.¹²⁻¹⁵ However, previous reports failed to take into account the fact that some states fund their tobacco-control programs from other revenue sources, such as the cigarette excise tax. Because state revenues are fungible, states that devote only a small portion of their settlement revenue to tobacco-control programs may,

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in fact, use other sources of income to fund these programs. Therefore, we performed a cross-sectional analysis to assess state expenditures for tobacco-control programs in the context of other state economic and health data.

METHODS

Sources of Data

Information on the amount of settlement funds received by each state in fiscal year 2001 and the way these funds were allocated was obtained from a data base compiled by the National Conference of State Legislatures.¹⁵ Allocation data were available for only 45 states. Data were not available for Arkansas, Missouri, Oregon, Pennsylvania, and Tennessee.

Data on state smoking rates (1999), smoking-attributable death rates (1990 to 1994), and state cigarette excise taxes (2000) were obtained from the CDC.¹⁶⁻¹⁸ State population data, as well as estimates of the proportion of the population without health insurance, were obtained from the Census Bureau.^{19,20} Per capita personal income data were obtained from the Bureau of Economic Analysis.²¹ Information on state Medicaid expenditures for fiscal year 1999 was obtained from the Centers for Medicare and Medicaid Services.²² Information on smoking-attributable Medicaid expenditures in 1993 was obtained from previously published population-based estimates.²³ Tobacco-crop production estimates were obtained from the Department of Agriculture.²⁴

Construction of Variables

Estimates of state per capita funding of tobacco-control programs in fiscal year 2001 were obtained by adding the settlement dollars devoted to tobacco-control programs (as reported by the National Conference of State Legislatures) to state tobacco-control-program funds derived from all other sources (as compiled by the CDC).^{14,15}

Settlement allocations by states were categorized as follows: tobacco-control programs, health care expenditures (Medicaid, dental health, and mental health), long-term care (home care, long-term care insurance, and pharmaceutical assistance for the elderly), and research on tobacco-related illnesses.¹⁵ Other categories included education, child and adolescent services, aid to tobacco-dependent communities, budget reserve (trust funds), and miscellaneous (ranging from flood control and law enforcement to tax reductions).¹⁵ We also calculated the proportion of allocated settlement funds that were devoted to tobacco-control programs for each state. The six states that produced more than 23 million kg (51 million lb) of tobacco in 1999 (Georgia, Kentucky, North Carolina, South Carolina, Tennessee, and Virginia), which account for about 94 percent of U.S. tobacco output, were defined as tobacco-producing states. Finally, the number of adult smokers in each state was estimated by multiplying the number of persons at least 18 years of age in each state by the adult smoking rate.

Statistical Analysis

State per capita funding of tobacco-control programs in 2001 was the main dependent variable in our analysis. For bivariate analysis, we used Spearman's rank test for correlation, as well as the t-test, allowing for unequal variances when necessary. In multiple linear regression, candidate predictor variables included several measures of the tobacco burden of each state, such as smoking-attributable expenditures and the rates of smoking and smoking-related deaths. Because these measures were likely to be strongly intercorrelated, we selected the measure with the strongest relation to tobacco-control-program funding in bivariate analysis (which was smoking rate) for inclusion in the model. The cigarette tax per pack, settlement revenue, and the proportion of each state's allocated settlement funds that was devoted to tobacco-control programs were also can-

didate predictor variables. A forward stepwise process was used, with retention of variables with P values of less than 0.10. Variables with highly skewed distributions were divided into quartiles.

Because of concern that state smoking rates might confound the relation between per capita funding for tobacco-control programs and other state characteristics, we repeated the analysis using the amount of funding for tobacco-control programs per smoker as the dependent variable. We also repeated the analysis after excluding tobacco-producing states. As a secondary analysis, we compared state characteristics with their allocation of settlement funds to tobacco-control programs and to other health care programs.

RESULTS

State-Level Expenditures for Tobacco-Control Programs

The states varied considerably in their expenditures for tobacco-control programs in 2001. The mean was \$3.49 per capita (Table 1). Most states invested far less money in tobacco control than the CDC recommended. The per capita allocation for tobacco-control programs recommended by the CDC varied from state to state, with a mean of \$7.47. Only six states exceeded the CDC recommendations.

Allocation of Tobacco-Settlement Revenue

The settlement funds received by the states in 2001 ranged from \$14.8 million (Wyoming) to \$974.2 million (Texas). There was substantial variability in the per capita amount of settlement funds, ranging from about \$12 for Utah to \$74 for Mississippi (Table 1). The median was just over \$26 per capita (interquartile range, \$19 to \$32).

State governments in aggregate distributed roughly \$6.5 billion in settlement funds in 2001. Approximately 6 percent of these funds were devoted to tobacco-control programs (Fig. 1). In aggregate, health care expenditures made up approximately 41 percent of the total state settlement allocations; long-term care and medical research received 3 percent and 4 percent, respectively. Tobacco-growing communities received about 5 percent, and over one third of the funds were distributed to other non-health-related programs, such as education, child and adolescent services, budget reserves, and miscellaneous programs.

Factors Associated with Expenditures for Tobacco-Control Programs

States with higher smoking rates had significantly lower expenditures for tobacco-control programs (Spearman's $\rho = -0.38$, $P = 0.007$) (Table 2 and Fig. 2). This finding persisted even after tobacco-producing states were excluded from the analysis. Funding for tobacco-control programs also showed a trend toward an inverse correlation with the rate of smoking-related deaths (Spearman's $\rho = -0.22$, $P = 0.12$) and the rate of death from lung cancer (Spearman's $\rho = -0.27$, $P = 0.06$). Smoking-attributable Medicaid expenditures were unrelated to funding of tobacco-control programs (Spearman's $\rho = 0.003$, $P = 0.82$).

TABLE 1. FUNDING FOR TOBACCO-CONTROL PROGRAMS AND TOBACCO-SETTLEMENT INCOME ACCORDING TO STATE.

STATE	EXPENDITURES FOR TOBACCO-CONTROL PROGRAMS PER CAPITA		2001 TOBACCO-SETTLEMENT REVENUE	
	2001 AMOUNT	AMOUNT RECOMMENDED BY CDC*	PER CAPITA AMOUNT	TOTAL AMOUNT†
	dollars			
Mean of 50 states	3.49	7.47	28.35	163,800,000
Pennsylvania	0.10	5.46	27.83	341,800,000
Ohio	0.13	5.52	27.52	312,400,000
Tennessee	0.24	6.00	26.61	151,400,000
Connecticut	0.30	6.50	32.42	110,400,000
Alabama	0.30	6.19	21.81	97,000,000
North Carolina	0.32	5.74	17.73	142,700,000
Louisiana	0.37	6.23	31.33	140,000,000
Missouri	0.43	6.07	25.40	142,100,000
Arkansas	0.58	7.10	19.23	51,400,000
Nevada	0.59	8.04	18.92	37,800,000
Texas	0.59	5.31	46.72	974,200,000
Oklahoma	0.59	6.58	18.63	64,300,000
Michigan	0.66	5.61	26.05	258,900,000
South Carolina	0.78	6.36	18.20	73,000,000
Kansas	0.83	6.96	19.23	51,700,000
Kentucky	0.84	6.42	25.98	105,000,000
North Dakota	1.71	12.73	35.35	22,700,000
New York	1.74	5.28	39.75	754,300,000
Idaho	1.75	9.13	17.39	22,500,000
New Mexico	1.89	7.93	20.34	37,000,000
Georgia	2.19	5.69	18.59	152,200,000
Illinois	2.26	5.46	23.25	288,700,000
Utah	2.46	7.40	12.36	27,600,000
Florida	2.49	5.35	45.76	731,300,000
Oregon	2.71	6.51	19.96	68,300,000
Virginia	2.82	5.77	17.91	126,800,000
Rhode Island	3.03	10.01	42.54	44,600,000
Washington	3.08	5.94	21.61	127,400,000
New Hampshire	3.29	9.28	35.04	43,300,000
Colorado	3.32	6.31	19.76	85,000,000
California	3.44	5.12	22.41	759,200,000
Iowa	3.52	6.78	18.42	53,900,000
New Jersey	3.80	5.60	28.50	239,800,000
Alaska	4.01	13.27	33.82	21,200,000
Maryland	4.05	5.95	26.47	140,200,000
Wisconsin	4.09	6.03	22.97	123,200,000
West Virginia	4.31	7.80	30.41	55,000,000
Delaware	4.61	11.80	29.99	23,500,000
Nebraska	4.83	8.03	21.56	36,900,000
Montana	4.85	10.65	29.04	26,200,000
Minnesota	4.92	6.11	68.50	337,000,000
South Dakota	5.15	11.77	28.62	21,600,000
Wyoming	5.62	15.39	29.97	14,800,000
Indiana	6.05	5.93	17.52	106,500,000
Arizona	7.32	6.10	17.09	87,700,000
Massachusetts	10.25	5.76	37.83	240,200,000
Hawaii	10.82	9.08	29.55	35,800,000
Vermont	12.58	13.42	40.24	24,500,000
Mississippi	12.82	6.88	74.21	211,100,000
Maine	15.47	9.01	37.10	47,300,000

*CDC denotes Centers for Disease Control and Prevention.

†Total amounts have been rounded to the nearest \$100,000.

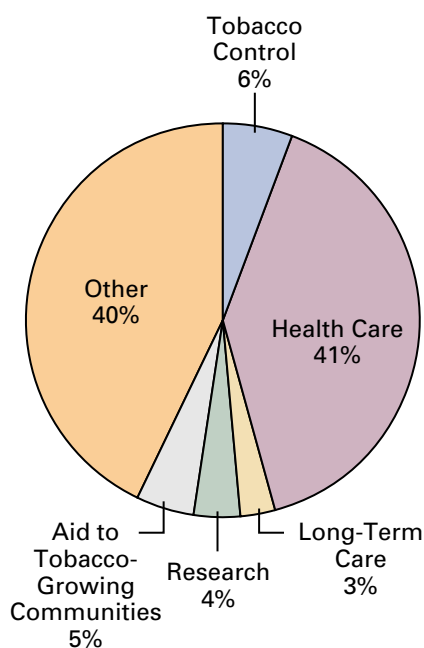


Figure 1. Allocation of Tobacco-Settlement Funds for Fiscal Year 2001.

The settlement funds allocated by the 45 states for which allocation data were available totaled roughly \$6.5 billion. The "Other" category includes education (3.8 percent of the total settlement funds allocated), child and adolescent services (3.7 percent), budget reserve (13.7 percent), and miscellaneous (18.7 percent). Percentages do not total 100 because of rounding.

The settlement was a major revenue source for tobacco-control programs. In aggregate, settlement dollars represented about 55 percent of all funds that were spent on tobacco control in 2001. There was a positive relation between funding of tobacco-control programs and state settlement income, in terms of settlement dollars per smoker (Spearman's $\rho=0.34$, $P=0.02$) and per capita (Spearman's $\rho=0.24$, $P=0.09$). At the state level, we found a strong relation between the proportion of settlement funds allocated to tobacco-control programs and funding of tobacco-control programs (Spearman's $\rho=0.63$, $P<0.001$). Among the states that were in the highest quartile in the proportion of their settlement allocated to tobacco-control programs, the mean per capita funding level of tobacco-control programs was \$6.93, whereas the remaining states had a mean level of \$2.73 ($P=0.01$). There was also a significant relation between the cigarette excise tax and spending on tobacco-control programs (Spearman's $\rho=0.29$, $P=0.04$).

Tobacco-producing states had significantly lower mean per capita expenditures for tobacco-control programs than the remaining states (\$1.20 vs. \$3.81,

TABLE 2. FACTORS ASSOCIATED WITH PER CAPITA SPENDING FOR TOBACCO-CONTROL PROGRAMS IN 2001.*

STATE CHARACTERISTICS	CORRELATION WITH PER CAPITA SPENDING FOR TOBACCO-CONTROL PROGRAMS	
	SPEARMAN'S RHO	P VALUE
Tobacco burden		
Smoking rate	-0.38	0.007
Smoking-related death rate	-0.22	0.12
Lung-cancer death rate	-0.27	0.06
Per capita smoking-attributable Medicaid expenditures	0.03	0.82
Tobacco-related revenue		
Cigarette excise tax	0.29	0.04
Tobacco-settlement funds		
Per capita	0.24	0.09
Per smoker	0.34	0.02
Proportion of tobacco settlement allocated to tobacco-control programs	0.63	<0.001
Proportion of tobacco settlement allocated to health care programs	0.01	0.92
Other		
Per capita income	0.06	0.70
Per capita state Medicaid expenditures	0.03	0.82
Proportion of population without health insurance	-0.08	0.55
	MEAN (\pm SE)	
	PER CAPITA SPENDING FOR TOBACCO-CONTROL PROGRAMS	
Tobacco production†		
Tobacco-producing states	\$1.20 \pm 0.42	} 0.008
Other states	\$3.81 \pm 0.55	

*Tobacco-settlement allocation data were available for all states except Pennsylvania, Tennessee, Missouri, Arkansas, and Oregon.

†The t-test was used for the comparison of tobacco-producing states and other states.

$P=0.008$). Tobacco-producing states also tended to have higher smoking rates than the other states, although this difference was not statistically significant. State per capita income, Medicaid expenditures, and the proportion of the population without health insurance were unrelated to the funding of tobacco-control programs. On multivariate analysis, the proportion of settlement revenue allocated to tobacco-control programs and the number of settlement dollars received per smoker were significant independent predictors of the funding of tobacco-control programs. When we repeated these analyses using the amount of funding of tobacco-control programs per adult smoker as the outcome variable, there was no significant change in the results.

Factors Associated with Allocation of State Settlement Funds

There was considerable variability among states in the proportion of settlement money that was allocat-

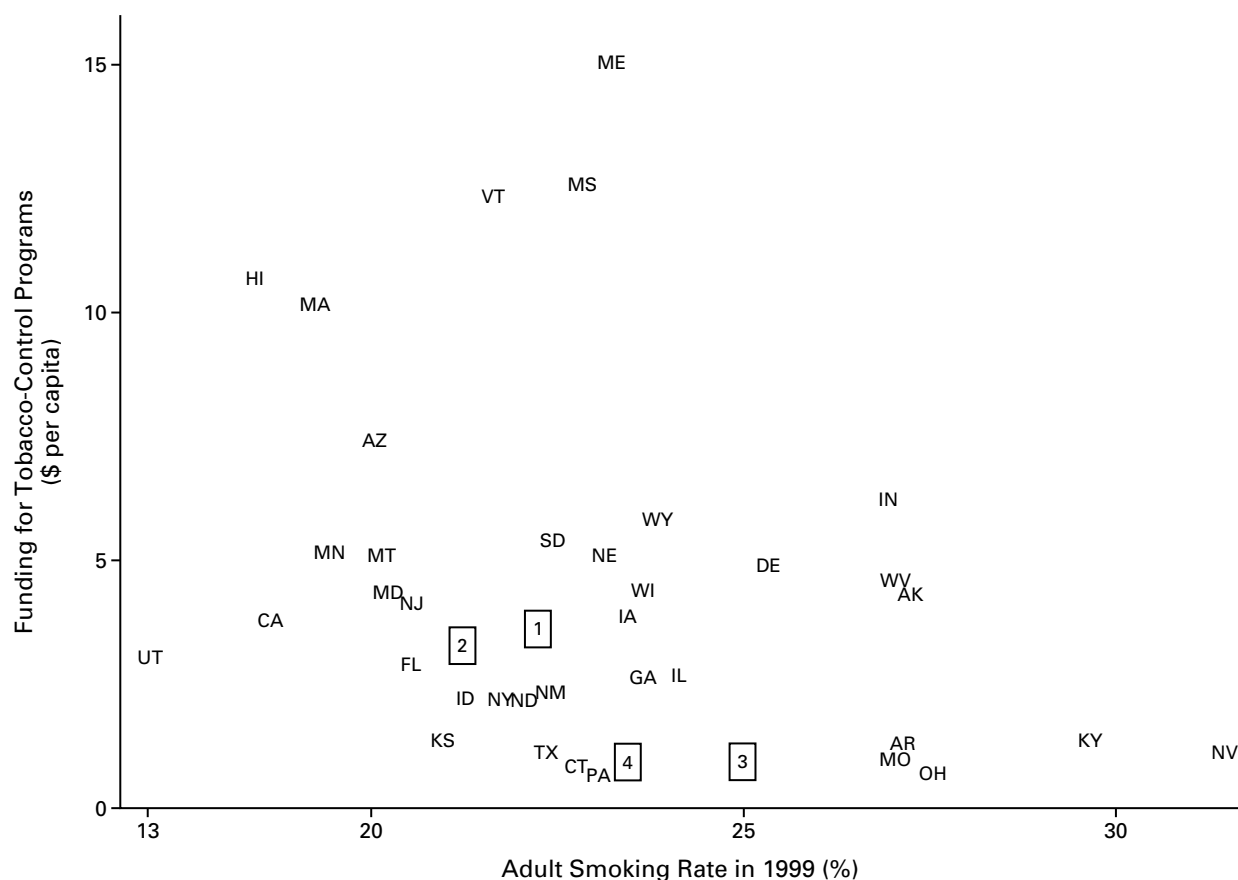


Figure 2. State Funding for Tobacco-Control Programs According to State Smoking Rates.

Several groups of states overlapped on the graph and are represented by the following boxed numbers: 1 — Colorado, Washington, Rhode Island, and New Hampshire; 2 — Oregon and Virginia; 3 — Tennessee, Michigan, North Carolina, and Oklahoma; and 4 — Louisiana, South Carolina, and Alabama.

ed to tobacco-control programs, with a range among states of 0 to 100 percent. Because the proportion of settlement revenue allocated to tobacco-control programs was strongly related to funding of tobacco-control programs, we tried to identify state characteristics that were associated with the use of settlement funds for this purpose. We found that legislatures in tobacco-producing states tended to devote a lower proportion of their settlement revenue to tobacco-control programs than did legislatures in other states (12.1 percent vs. 4.1 percent of allocated settlement funds, $P=0.03$). There was no relation between the proportion of settlement funds allocated to tobacco-control programs and various measures of tobacco-related health burden: smoking rate, smoking-related mortality or mortality from lung cancer, or smoking-attributable Medicaid expenditures.

Because such a substantial proportion of state revenue was devoted to health care programs, we also an-

alyzed state characteristics that might be related to the use of settlement funds for this purpose. We found that states in which a higher proportion of the population was without health care insurance tended to use more of their settlement funds for health care (Spearman's $\rho=0.62$, $P<0.001$). There was no relation between health care allocation and per capita income, per capita Medicaid expenditures, or any of the other state variables mentioned above.

DISCUSSION

Our analysis demonstrates that the most important predictor of funding for tobacco-control programs was not the prevalence of smoking or health needs, but settlement-fund allocation. A small proportion of tobacco-settlement dollars was allocated to tobacco-control programs in 2001. The effect of allocation decisions was made explicit in our analysis, which demonstrated that states devoting a higher proportion

of their settlement funds to tobacco-control programs tended to achieve higher levels of funding of tobacco-control programs. This relation could have been expected, because when the tobacco-control-program expenditures from all 50 states were considered in aggregate, over half of the funding was derived from settlement income. This places a greater sense of urgency on the use of the settlement funds for tobacco-control programs.

The inverse correlation between state smoking rates and funding of tobacco-control programs is of serious concern. A possible explanation for this finding is variability in the local tobacco culture among states. We found that tobacco-producing states were investing less than half as much in their tobacco-control programs as other states. Political and economic concerns may make it less attractive for lawmakers to support tobacco-control programs in these states. For example, legislatures in tobacco-producing states invested a lower proportion of their tobacco-settlement allocations in tobacco-control programs and also tended to have lower cigarette excise taxes (\$0.07 vs. \$0.46, $P < 0.001$). Previous research has shown that excise-tax-induced price increases can independently reduce tobacco consumption.^{25,26} However, when tobacco-producing states were excluded from the analysis, the inverse relation between smoking rates and funding of tobacco-control programs persisted, suggesting that state tobacco production is not the sole explanation for this finding.

Another explanation for this inverse relation is that states with higher funding levels now enjoy lower smoking rates as a result of their generously funded programs. This is not likely, given that most state tobacco-control programs are relatively new and that their effect is thought to be incremental, accruing over several years.^{8,9,27} When we excluded from our analysis the five states with comprehensive programs initiated before 1998 (California, Massachusetts, Arizona, Oregon, and Florida), this relation persisted.

We found significant variability in the amount of settlement funds received by the 46 states participating in the Master Settlement Agreement. (The four states that did not participate were Florida, Minnesota, Mississippi, and Texas.) The settling states used an allocation formula based on smoking-attributable state Medicaid expenditures. Estimating smoking-attributable expenditures is a complex and imprecise process, for which there is no universally accepted formula. In addition, state Medicaid spending varies dramatically among states. As a result, states with more generous Medicaid programs had higher smoking-attributable Medicaid expenditures and therefore received more generous settlements. This inequity could have a direct effect on funding of tobacco-control programs, since our data suggest that states with less set-

tlement income are spending less on these programs.

Although the need to recoup smoking-attributable medical expenditures provided a rationale for the lawsuits that led to the settlement, states in which such expenditures are higher are not investing more in tobacco-control programs. We did find that states with greater short-term health care needs (as indicated by the proportion of the population without health insurance) devoted a higher proportion of their settlements to short-term health care. This may reflect a tendency for legislatures in states with a higher proportion of residents without insurance to prioritize their health dollars by opting to allocate more to short-term expenditures. However, budgetary allocations are highly fungible. From our data, we cannot determine whether the settlement dollars were being devoted to increasing benefits per person, increasing the number of beneficiaries, or merely replacing existing dollars without increasing Medicaid spending at all.

Over one third of the settlement funds were allocated to non-health-related programs. It could be argued that this distribution is appropriate, since settlement income is a replacement for funds that would have been spent on non-health-related programs but had to be diverted to health programs in order to treat tobacco-related illness. However, tobacco-related illnesses represent more than a financial drain on state budgets, because state citizens suffer directly from the effects of tobacco use on their health, economic, and functional status.

About 20 states have invested their settlement income in trust funds. Some of the subsequent revenues from these funds may be devoted to tobacco-control programs. In addition, county and city governments in New York and California also received a portion of their states' settlement income; data on local-government allocations were unavailable.

It is unclear exactly how much money states should invest in their tobacco programs. The effectiveness of programs is probably correlated with funding levels, since the effectiveness of the California program decreased when funding was cut from about \$2.92 to \$1.55 per capita in the early 1990s.²⁸ Although the CDC recommendations may be generous, even the states with the lowest per capita settlement had more than enough settlement income to cover the minimal level of funding of tobacco-control programs recommended by the CDC. Future work should explore the cost effectiveness of state tobacco-control programs in order to enable policy makers to reliably estimate the effect of different funding levels on smoking rates.

The paucity of settlement funds directed to tobacco-control programs is of particular concern for two reasons. The recent economic recession has tightened state budgets, and preliminary reports suggest that

state legislatures may be turning to the settlement funds as an alternative to raising taxes or decreasing budgets.^{29,30} In addition, a national tobacco lawsuit is currently being considered.³¹ Given the current pattern of state settlement allocations, there is reason to be concerned that revenues derived from a national tobacco lawsuit might not result in substantially greater revenue for tobacco-control programs.

Were the settlements a good deal or not? It is still early in the settlement period, and time will tell whether the states' settlements will lead to improved health for their citizens. *Healthy People 2010* includes several tobacco-related objectives, including reducing tobacco use and environmental tobacco exposure, as well as increasing attempts to stop smoking among current smokers.³² State legislatures should use their tobacco-settlement income to ensure that these objectives are met.

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