Controlling Cocaine: Supply Versus Demand Programs
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Summary

The number of cocaine users peaked in the early 1980s at about 9 million, and has gradually decreased to a little more than 7 million today. However, that downward trend in the total number of users is misleading, because a decline in the number of light users has masked an increase in the number of heavy users.[1]

Heavy users consume cocaine at a rate approximately eight times that of light users, so the upward trend in consumption by heavy users roughly cancels the downward trend in consumption by light users. The result is that total consumption of cocaine in the United States has remained at its mid-1980s peak for almost a decade (see Figure S.1).

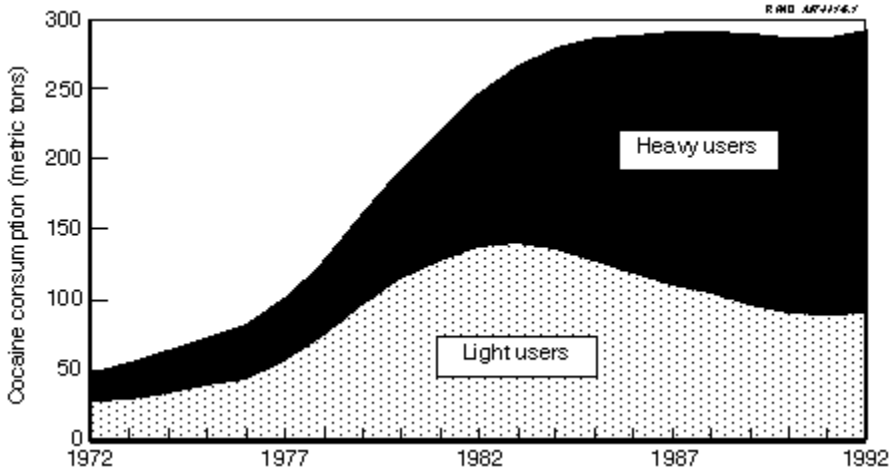

Figure S.1--Cocaine Consumption, by Type of User: 1972-1992

The persistence of high levels of cocaine consumption indicates the magnitude of the cocaine problem and the need for government to think carefully about its response. Part of thinking carefully includes estimating the relative cost-effectiveness of various available interventions. Four such interventions analyzed in this report are:

Source-country control: coca leaf eradication; seizures of coca base, cocaine paste, and the final cocaine product in the source countries (primarily Peru, Bolivia, and Colombia).

Interdiction: cocaine seizures and asset seizures by the U.S Customs Service, the U.S. Coast Guard, the U.S. Army, and the Immigration and Naturalization Service (INS).

Domestic enforcement: cocaine seizures, asset seizures, and arrests of drug dealers and their agents by federal, state, and local law enforcement agencies; imprisonment of convicted drug dealers and their agents.

Treatment of heavy users: outpatient and residential treatment programs.

This study analyzes the relative and, to a lesser extent, absolute cost-effectiveness of these programs. The first three programs focus on "supply-control." They raise the cost to dealers of supplying cocaine by seizing drugs and assets, and by arresting and incarcerating dealers and their agents. The increased production costs raise retail cocaine prices and thus reduce consumption, partly by discouraging current consumption and partly by modifying the flows of people into and out of cocaine use, so that the number of cocaine users gradually declines.

The fourth program is a "demand-control" program: It reduces consumption directly, without going through the price mechanism. Treatment reduces consumption in the short term, because most clients stop their cocaine use while in the program, and in the longer term, because some clients stay off heavy drug use even after treatment ends.

User sanctions (arresting and incarcerating people for using drugs) and drug-abuse prevention programs (both school-based and community-based) are also viable interventions, but analyzing them is beyond the scope of the present study.

To assess the cost-effectiveness of these programs, one needs to know (1) how much is being spent on them and (2) what benefits accrue from that spending. Determining current spending levels, although time-consuming in practice, is conceptually straightforward.

Currently, an estimated $13 billion is being spent in the United States each year on the four cocaine-control programs listed above. The bulk of these resources goes to domestic enforcement--drug busts, jails, and prisons are expensive. Treatment accounts for only a 7 percent share of this expenditure, even when privately funded treatment is included (see Figure S.2).

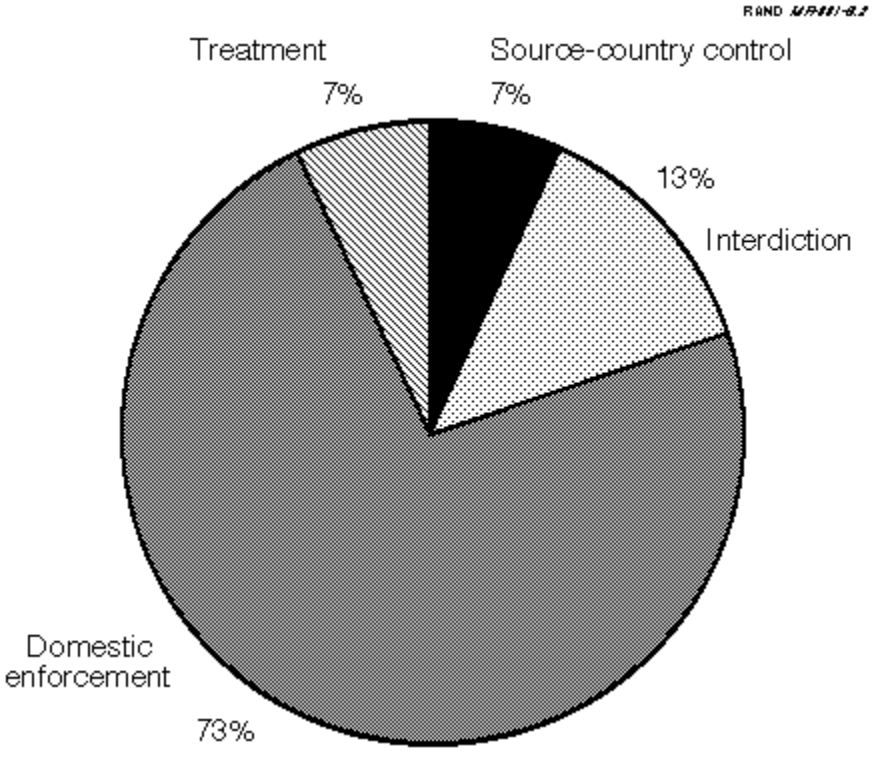

Figure S.2--Distribution of Annual Expenditure on Cocaine Control: 1992

Measuring the benefits of the four programs is more difficult, in part because they produce disparate effects. Supply-control programs generate cocaine seizures, asset seizures, and arrest and imprisonment of drug dealers. Treatment programs induce people to stop using cocaine. These outcome measures cannot be directly compared; they must first be translated into a common measure of effectiveness. For much of this analysis, the common measure used is the cost of a given reduction in U.S. consumption of cocaine.

The analytical goal is to make the discounted sum of cocaine reductions over 15 years equal to 1 percent of current annual consumption. The most cost-effective program is the one that achieves this goal for the least additional control-program expenditure in the first projection year. The additional spending required to achieve the specified consumption reduction is $783 million for source-country control, $366 million for interdiction, $246 million for domestic enforcement, or $34 million for treatment (see Figure S.3). The least costly supply-control program (domestic enforcement) costs 7.3 times as much as treatment to achieve the same consumption reduction.

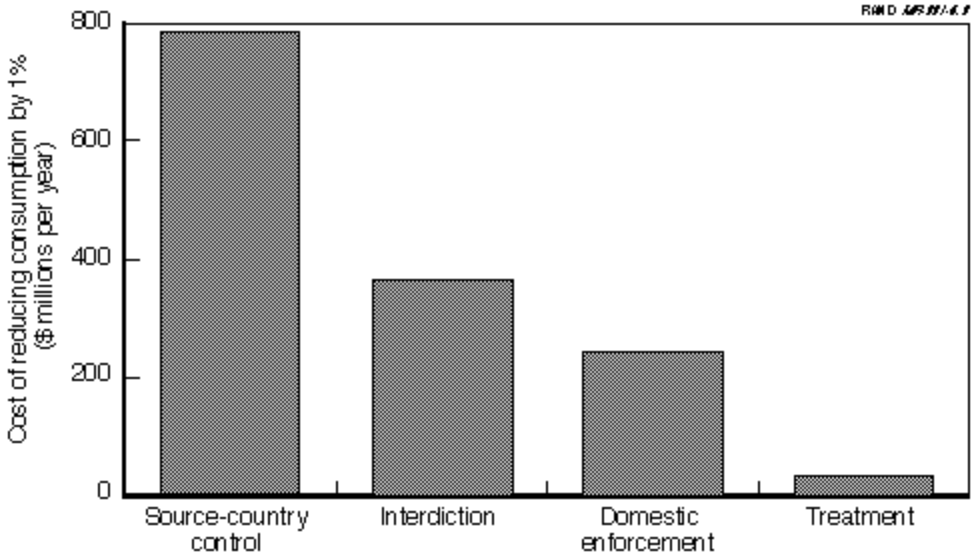

Figure S.3--Cost of Decreasing Cocaine Consumption by 1 Percent with Alternative Cocaine-Control Programs

The short story behind the supply-control cost estimates is that money spent on supply-control programs increases the cost to producers of supplying the cocaine. Supply costs increase as producers replace seized product and assets, compensate drug traffickers for the risk of arrest and imprisonment, and devote resources to avoiding the seizures and arrests. These added costs get passed along to the consumer as price increases, which in turn decreases consumption.

For example, a $246 million additional annual expenditure on domestic enforcement causes annual cocaine supply costs to increase by an estimated $750 million, or 2 percent of the estimated $37.6 billion spent annually by consumers on cocaine. Assuming that the percentage decrease in consumption caused by a price increase is half the percentage

price increase, the additional control expenditure achieves the goal of reducing consumption by 1 percent.

The specific cost estimates for the supply-control programs are, of course, driven by the assumption that a 1 percent increase in price causes a 0.5 percent decrease in cocaine consumption. (Some of this consumption decrease occurs immediately as this year's price increase reduces current consumption; the rest occurs gradually over time as the price increase alters flows of people into and out of cocaine use.) If the consumption decrease caused by a price increase is large, the costs of achieving the specified consumption reduction with supply-control programs will be proportionately small. However, the finding that treatment programs are more cost-effective than enforcement programs is not in question, because the effect of price on consumption would have to be 7 times the assumed level to alter that conclusion.

The estimate that an additional $34 million dollars spent on cocaine treatment would reduce cocaine consumption by 1 percent is based on two factors: (1) most users stay off drugs while in treatment, and (2) some users stay off drugs after treatment.

The average cocaine treatment (a mixture of relatively inexpensive outpatient and relatively expensive residential treatments, including partial as well as complete treatments) costs $1,740 per person treated, so $34 million pays for 19,500 treatments. These additional treatments are assumed to be given to heavy cocaine users (of whom there are about 1.7 million today) with average use of about 120 grams of cocaine a year. The average treatment lasts 0.3 years, and 80 percent of people in treatment are off drugs, so the in-treatment effect of 19,500 treatments is about 5,000 person-years less heavy cocaine use, which amounts to 0.6 metric tons less cocaine consumption.

An estimated 13 percent of heavy users treated do not return to heavy use after treatment. Although not all those departures are permanent, during the 14 years following treatment, the 19,500 treatments would generate an estimated present value of 20,000 person-years less heavy cocaine use, which amounts to 2.4 metric tons less cocaine consumption. If we add the 0.6 metric ton in-treatment reduction to the 2.4 metric ton after-treatment reduction, we find that 19,500 additional treatments would reduce cocaine consumption by an amount equal to 1 percent of the 300 metric tons currently consumed annually.

The *specific* cost advantage of treatment over enforcement ($34 million as opposed to $246 million for domestic enforcement to achieve the same benefit) depends crucially on the estimated after-treatment effect. However, the cost advantage is so large that even if the after-treatment effect is ignored, treatment still is more cost-effective than enforcement. The in-treatment effect is one-fifth of the total, and five times $34 million is still less than $246 million.

Reducing the quantity of cocaine consumed is not the only possible measure of program effectiveness. However, our findings about the relative cost-effectiveness of the different control programs do not depend upon the choice of evaluation criteria. The cost-effectiveness ranking of the control programs studied here is the same whether one evaluates the programs in terms of their effects on consumption, the number of users, or societal costs of crime and lost productivity due to cocaine use. That is, in all cases, the

supply-control programs are more costly than treatment programs per unit accomplishment (see Figure S.4).

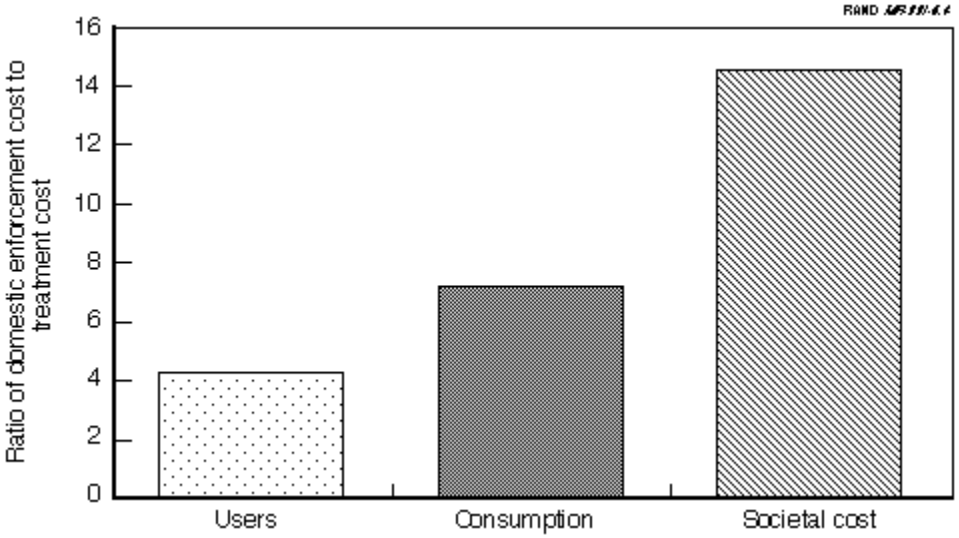

Figure S.4--Cost of Domestic Enforcement Relative to Treatment, for 1 Percent Reductions in Alternative Evaluation Criteria

The extent to which supply-control measures are more expensive, however, does vary depending on the evaluation measure chosen. Domestic enforcement costs 4 times as much as treatment for a given amount of user reduction, 7 times as much for consumption reduction, and 15 times as much for societal cost reduction.

These results suggest that if an additional dollar is going to be spent on drug control, it should be spent on treatment, not on a supply-control program. They do not, however, indicate whether or not that dollar should be spent in the first place. It might be that all four programs generate greater benefits than they cost, and treatment is just the best of four good programs. Or, at the other extreme, treatment might be merely the least ineffective of four ineffective programs.

With the first two criteria, quantity of cocaine consumed and number of users, this is as specific as one can get without placing a figure on the dollar value of reducing U.S. cocaine consumption by 1 metric ton or the number of users by 1,000. The benefits under the third criterion, reductions in the societal cost of crime and lost productivity, are, however, already measured in dollars. Hence, using this criterion, we can make some estimates of the four programs' absolute cost-effectiveness. The reader is cautioned, however, that societal costs are difficult to define, let alone measure; thus our estimates are very rough. Nevertheless, the results are intriguing.

This study found that the savings of supply-control programs are smaller than the control costs (an estimated 15 cents on the dollar for source-country control, 32 cents on the dollar for interdiction, and 52 cents on the dollar for domestic enforcement). In contrast, the savings of treatment programs are larger than the control costs; we estimate that the costs of crime and lost productivity are reduced by $7.46 for every dollar spent on treatment (see Figure S.5).

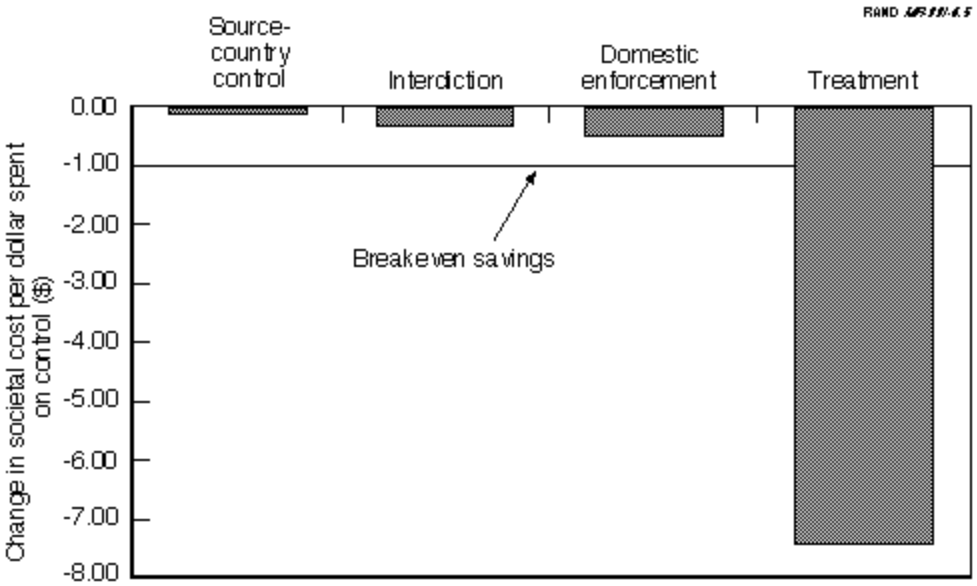

Figure S.5--Savings in Societal Costs of Crime and Lost Productivity Due to Cocaine Use per Dollar Spent on a Control Program

Our findings thus suggest a way to make cocaine control policy more cost-effective: Cut back on supply control and expand treatment of heavy users. In light of this conclusion, four (prominent) alternatives to current policy are explored this study:

> **Alternative A:** decrease each of the three supply-control program budgets by 25 percent.
>
> **Alternative B:** decrease the supply-control budgets by 25 percent and double the current treatment budget.
>
> **Alternative C:** decrease the supply-control budgets by 25 percent and treat 100 percent of heavy users each year.
>
> **Alternative D:** treat 100 percent of heavy users each year without changing the supply-control budget.

Our best estimates of the consequences of pursuing these alternatives to current policy are summarized in Figure S.6 and Table S.1. If supply-control budgets are cut by 25 percent (Alternative A), the cocaine problem (as measured by consumption) gets worse, but the supply-control cuts make the overall control budget decrease. However, spending about half of the supply-control savings on doubling treatment (Alternative B) reduces cocaine consumption below what would occur under current policy. Expanding treatment to all heavy users (Alternative C) further reduces consumption and uses up essentially all the savings from the supply-control cut. Finally, if all heavy users are treated and the supply-control budget is not cut (Alternative D), consumption decreases even more, but the control budget is one-fifth higher than it is under current policy.

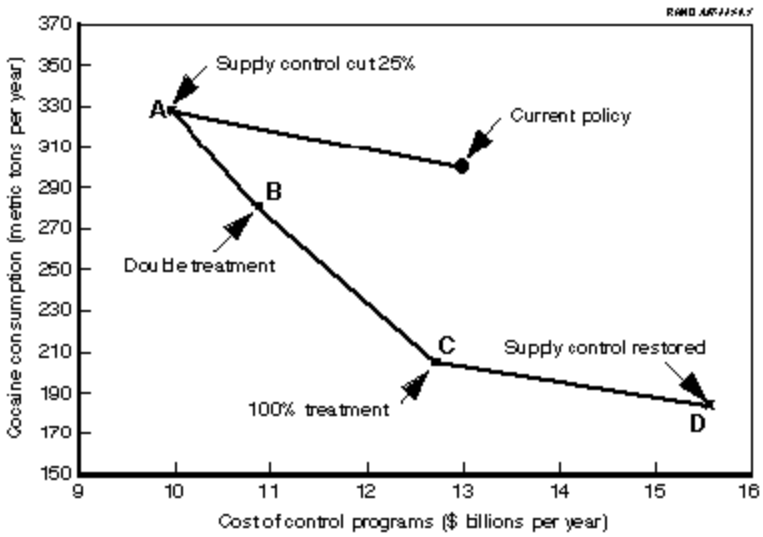

Figure S.6--Cocaine-Control Budget vs. Cocaine Consumption

Table S.1
Comparison of Alternative Composite Cocaine-Control Programs

		Evaluation Criterion			
Intervention Strategy	Total Control Cost ($ billions/yr)	Users (millions)	Consumption (metric tons/yr)	Societal Costs[a] ($ billions/yr)	Societal Cost plus Control Costs ($ billions/yr)
Current policy	13.0	7.06	314	29.0	42.0
Alternative A: Supply control – 25%	10.0	7.28	344	30.0	40.0
Alternative B: Double treatment	10.9	7.06	294	25.8	36.7
Alternative C: 100% treatment	12.7	6.67	211	19.0	31.7
Alternative D: Restore supply ctrl	15.6	6.42	188	18.3	33.9

NOTE: Alternative A cuts all three supply-control program budgets by 25 percent; Alternative B spends one-third of the supply-control savings on doubling the current treatment budget; Alternative C spends nearly all the supply-control savings to treat 100 percent of the heavy users each year; and Alternative D treats 100 percent of the heavy users each year with no cut in the supply-control budget. Estimates are annualized values over 15 projection years using a 4 percent real discount rate.

[a]Estimated cost of crime and lost productivity due to cocaine use.

Decreasing supply control by 25 percent and doubling treatment (Alternative B) would leave the number of users essentially unchanged but would decrease average annual consumption by 20 metric tons (a 6 percent reduction). This composite program would save $2.1 billion in annual costs of cocaine control and $3.2 billion in annual societal costs, for a total annual saving of $5.3 billion.

Further expanding treatment to cover all heavy users (Alternative C) would decrease the number of users by 0.39 million and decrease average annual consumption by 103 metric tons, relative to current policy. The total annual cost of cocaine control would be only

$0.3 billion less than under current policy, but societal costs would decrease by $10.0 billion, for total annual saving of $10.3 billion.

Finally, treating all heavy users without changing the current budget for supply control would decrease user counts, annual consumption, and societal costs even more. However, restoring the supply-control budget would increase control costs more than it would decrease societal costs, so the total annual saving relative to current policy, $8.1 billion, would be less than that under Alternative C.

Hence, this report concludes that treatment of heavy users is more cost-effective than supply-control programs. One might wonder how this squares with the (dubious) conventional wisdom that, with treatment, "nothing works." There are two explanations. First, evaluations of treatment typically measure the proportion of people who no longer use drugs at some point after completing treatment; they tend to underappreciate the benefits of keeping people off drugs while they are in treatment--roughly one-fifth of the consumption reduction generated by treatment accrues during treatment. Second, about three-fifths of the users who start treatment stay in their program less than three months. Because such incomplete treatments do not substantially reduce consumption, they make treatment look weak by traditional criteria. However, they do not cost much, so they do not dilute the cost-effectiveness of completed treatments.

Does this mean that treatment is a panacea? Unfortunately not, because there is a limit on how much treatment can be done. In our analysis, we explore the consequences of treating every heavy user once each year (Alternatives C and D). In principle, even more treatment is possible because the average duration of a treatment is less than 12 months. However, considering the difficulties of getting people into treatment, more treatment may not be feasible. Treating all heavy users once each year would reduce U.S. consumption of cocaine by half in 2007, and by less than half in earlier years (see Figure S.7).

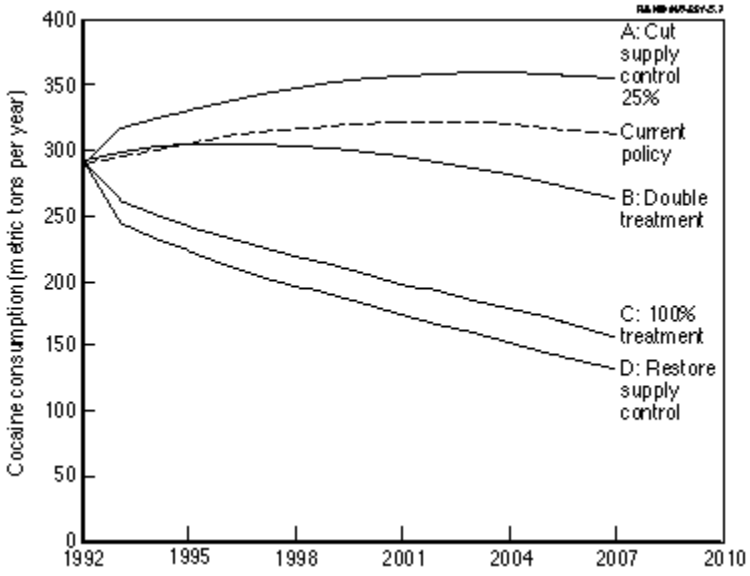

Figure S.7--Dynamics of Change in Cocaine Consumption

[1] This analysis defines "heavy use" as once a week or more and "light use" as at least once a year, but less than weekly. At the end of 1992, there were an estimated 5.6 million light users and 1.7 million heavy users, by these definitions.