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Killer Airbags

Federal law requires that new cars be equipped with devices that kill drivers and passengers. If this sounds odd, the story gets stranger when you realize these devices are supposed to—and sometimes do—*save* lives. The devices in question are airbags, and their saga illustrates almost all of the important principles you should know to understand the economics of public issues.

The airbag story begins in 1969, when the Nixon administration first proposed requiring "passive" restraints that would protect motorists during collisions even if they took no actions to protect themselves. The ideal system was thought to be airbags that would automatically inflate in the event of a collision. But a special government study commission found the airbags then available were not only extremely costly and unreliable but were in fact dangerous to the occupants of cars, especially to young children. So, instead of airbags, the government tried requiring seat belts that prevented cars from being started unless the belts were fastened. Inconvenienced consumers who disliked seat belts quickly rejected these, and the idea of airbags was revived and eventually mandated by the federal government. In anticipation of the requirements that 1998 cars have them on both the driver and passenger sides, automakers began installing airbags on selected models in 1989. By 1997, more than 65 million cars had driver-side bags, and about 35 million had them on the passenger side, too.

At first it seemed as though the earlier problems with airbags had been solved. The installed cost of about $400 apiece was far less than it would have been when the bags were initially proposed, and their reliability was dramatically increased. News reports soon began appearing with stories of seemingly miraculous survival by occupants of airbag-equipped cars in collisions. By the end of 1995, it was estimated that airbags had saved more than 1500 lives since 1989.

As the population of cars with airbags grew, however, another set of stories began to appear: Airbags deploy at speeds up to 200 mph and are designed to be most effective when used in conjunction with seat belts. It soon became apparent that people who failed to use belts, people who sat closer than the normal distance from the steering wheel or dashboard, and—most ominously—children anywhere in the front seat were at increased risk of serious injury or death due to airbag deployment. By late 1997 it was estimated by the federal government that although a total (since 1989) of perhaps 2600 people owed their lives to airbags, there were more than 80 people, most of them children, who had been killed by the force of normally deploying airbags.

The outcry over the deaths of children killed in low-speed crashes by the very devices that were supposed to protect them generated action by both the private sector and the federal government. Auto manufacturers and their suppliers began developing "smart" airbags that sense the severity of a collision, the size of the person in the front seat, and whether the person is properly belted. Then, depending on the results of those measurements, the bag decides whether to deploy and at what speed it will do so. As an interim solution, in November 1997 (four and a half years after the first documented airbag fatality) the Department of Transportation announced that consumers would be allowed to apply for permission to have airbag cutoff switches installed in their vehicles. The estimated cost to consumers who have the switches installed is $150 to $200 per car. State governments also got in the act, with many of them mandating that children under a certain age or size be prohibited from occupying the front seat of an automobile.

Beginning with the 1998 model year, manufacturers also began installing less powerful airbags that inflate 22 percent less quickly on the driver side and 14 percent less quickly on the passenger side. The result has been a sharp reduction in (although not an elimination of)

airbag-induced fatalities. By 2004, more than 130 million autos equipped with airbags were on the road. The federal government had credited the devices with saving 10,300 lives in serious, high-speed crashes since 1989, at a cost of about 230 people—two-thirds of them children—killed by airbag deployments in low-speed crashes.

What can we learn from the airbag episode that will guide us in thinking about other public issues of our times? There are several general principles:

1. *There is no free lunch.* Every choice, and thus every policy, entails a **cost**—something must be given up. In a world of scarcity, we cannot have more of everything, so to get more of some things, we must give up other things. Simply put, we face trade-offs. In this case, although airbags increase the safety of most adults, there is both a monetary cost of $800 per car and a reduced level of safety for children riding in the front seat.

2. *The cost of an action is the alternative that is sacrificed.* Economists often express costs (and benefits) in terms of dollars, because this is a simple means of accounting for and measuring them. But that doesn't mean costs have to be monetary, nor does it mean economics is incapable of analyzing costs and benefits that are very human. In the case of airbags, the cost that induced action by consumers, manufacturers, and government officials was the lost lives of scores of children.

3. *The relevant costs and benefits are the marginal (or incremental) ones.* The relevant question is not whether safety is good or bad; it is instead how much safety we want—which can only be answered by looking at the added (or marginal) benefits of more safety compared to the added (marginal) costs. One possible response to the child fatalities would have been to outlaw airbags on new cars and mandate that all installed airbags be deactivated. That would have guaranteed that no more children would have been killed by airbags. But for many people (such as those without young children), this solution to airbag fatalities would not be sensible, because the marginal cost would exceed the marginal benefit.

4. *People respond to incentives.* A rise in the apparent costs of using airbags (due to airbag fatalities among children) reduced consumers' desire to utilize airbags and induced them to put pressure on the federal government—pressure that convinced the Department of

Transportation to change the regulations. Moreover, the simultaneous rise in the rewards of developing alternatives to today's airbags sent suppliers scurrying to find those alternatives, including "smart" airbags.

5. *Things aren't always as they seem.* Many analyses of the effects of government policies take an approach that doesn't fully recognize the behavior people otherwise *would* have undertaken. Thus, official pronouncements about the consequences of policies routinely misrepresent their impact—not because there is necessarily any attempt to deceive, but because it is often so difficult to know what would have happened otherwise. For example, the claim that 10,300 lives have been "saved" by airbags is portrayed as the benefit of the government mandate that all new cars have airbags. In fact, absent the airbag regulations, it is highly likely that automobile manufacturers would have devised other systems—better seat belts, vehicles with additional "crush space" in the passenger compartment, or perhaps even some form of optional passive restraint system—that would have saved many of the lives supposedly saved by government-mandated airbags. Moreover, as we discuss more fully in Principle 6 (below), individuals themselves would have behaved much differently absent the airbag regulations. Given the speculative nature of such hypothetical behavior, the people reporting the numbers are (justifiably) reluctant to estimate the effects; we are thus served up the far safer statistic of "10,300 lives saved."

6. *Policies always have unintended consequences, and as a result, their net benefits are almost always less than anticipated.* Information, like all goods, is costly to obtain, and sometimes the cheapest way to learn more about something is simply to try it. When it is tried, new things will be learned, not all of them pleasant. More importantly, in the case of government regulations, Principle 3 (above) fails to make good headlines. Instead, what gets politicians reelected and regulators promoted are fundamental, *absolute* notions, such as "safety" (and motherhood and apple pie). Thus, if a little safety is good, more must be better, so why not simply mandate that all front-seat passengers in all cars be protected by airbags that are all the same? Eventually, the reality of Principle 3 sinks in, but in this case not before scores of children had lost their lives.

Although these basic principles of public issues are readily apparent when looking at the children who have been killed by airbags, they are just as present in two other features of airbags that have received far less attention. First, most airbag deployments occur in relatively low-speed accidents (under 30 miles per hour), when the added safety benefits to properly belted occupants is low. But once the bags are deployed, they must be replaced, and often so must the windshield (blown out by the passenger-side bag) and sometimes even the dashboard (damaged as the airbag deploys). The added repair cost per car is currently estimated to be between $2000 and $2500. Thus, not only have automobile repair costs soared due to airbags, many cars that routinely would have been repaired are now written off completely because it is too costly to fix them.

Second, and more significantly, cars that are airbag-equipped tend to be driven more aggressively, apparently because their occupants feel more secure. The result is more accidents by such cars, more serious accidents (such as rollovers) that kill occupants despite the airbags, and a higher risk of pedestrian fatalities—none of which are accounted for in the lives-saved figures that we quoted earlier. In addition, when seat belts are worn, they are almost as good as airbags in preventing fatalities among automobile occupants. Belts reduce the fatality rate by 45 percent; adding an airbag increases this only to 50 percent. The net effect is that even though airbags are both better and less costly than they were when first proposed, it is still not clear that they yield benefits exceeding their costs.

Despite this uncertainty about the net benefits of front-impact airbags, manufacturers are now installing side-impact airbags on some new automobiles. (By the time you read this, the federal government may have issued regulations mandating these devices on all new cars.) These new bags deploy in the event a vehicle is hit from the side in a crash and are designed chiefly to protect the head. The privately operated Insurance Institute for Highway Safety estimates that these airbags can cut fatalities in side-impact crashes to about 1.5 per 1000 accidents from the current rate of roughly 3 per 1000 accidents. Whether these estimates will be borne out in the real-world experience with side-impact airbags remains to be seen. Nevertheless, one thing seems highly likely: the new airbags are almost certain to have unintended consequences

for automobile occupants. One can only hope that not many of them are fatal.

DISCUSSION QUESTIONS

1. Under what circumstances is it appropriate to trade off human lives against dollars when making decisions about safety?
2. Do you think government action allowing airbag deactivation and depowered airbags would have been as swift or as likely if all the fatalities had been among adults rather than chiefly among small children?
3. Do you think government regulators do (or should) distinguish between the *voluntary* choices adults make for themselves (such as not wearing motorcycle helmets or seat belts), versus the decisions to which young children are *involuntarily* exposed by adults (such as being placed unbelted in an automobile or subjected to second-hand cigarette smoke)?
4. Most people, without any government regulation requiring it, have locks on their doors to protect them from intruders. If airbags are so good at protecting people from injuries and death, why were government regulations required to get them installed on automobiles?