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The Tipping Point
Why is the city suddenly so much safer---
could it be that crime really is an epidemic?

1.

   As you drive east on Atlantic Avenue, through the part of New York City that the Police Department refers to as Brooklyn North, the neighborhoods slowly start to empty out: the genteel brownstones of the western part of Brooklyn give way to sprawling housing projects and vacant lots. Bedford-Stuyvesant is followed by Bushwick, then by Brownsville, and, finally, by East New York, home of the Seventy-fifth Precinct, a 5.6-square-mile tract where some of the poorest people in the city live. East New York is not a place of office buildings or parks and banks, just graffiti-covered bodegas and hair salons and auto shops. It is an economically desperate community destined, by most accounts, to get more desperate in the years ahead-which makes what has happened there over the past two and a half years all the more miraculous. In 1993, there were a hundred and twenty-six homicides in the Seven-Five, as the police call it. Last year, there were forty-four. There is probably no other place in the country where violent crime has declined so far, so fast.

   Once the symbol of urban violence, New York City is in the midst of a strange and unprecedented transformation. According to the preliminary crime statistics released by the F.B.I. earlier this month, New York has a citywide violent-crime rate that now ranks it a hundred and thirty-sixth among major American cities, on a par with Boise, Idaho. Car thefts have fallen to seventy-one thousand, down from a hundred and fifty thousand as recently as six years ago. Burglaries have fallen from more than two hundred thousand in the early nineteen-eighties to just under seventy-five thousand in 1995. Homicides are now at the level of the early seventies, nearly half of what they were in 1990. Over the past two and a half years, every precinct in the city has recorded double-digit decreases in violent crime. Nowhere, however, have the decreases been sharper than Brooklyn North, in neighborhoods that not long ago were all but written off to drugs and violence. On the streets of the Seven-Five today, it is possible to see signs of everyday life that would have been unthinkable in the early nineties. There are now ordinary people on the streets at dusk-small children riding their bicycles, old people on benches and stoops, people coming out of the subways alone. "There was a time when it wasn't uncommon to hear rapid fire, like you would hear somewhere in the jungle in Vietnam," Inspector Edward A.

Mezzadri, who commands the Seventy-fifth Precinct, told me. "You would hear that in Bed-Stuy and Brownsville and, particularly, East New York all the time. I don't hear the gunfire anymore. I've been at this job one year and twelve days. The other night when I was going to the garage to get my car, I heard my first volley. That was my first time."

But what accounts for the drop in crime rates? William J. Bratton-who as the New York City Police Commissioner presided over much of the decline from the fall of 1994 until his resignation, this spring-argues that his new policing strategies made the difference: he cites more coördination between divisions of the N.Y.P.D., more accountability from precinct commanders, more arrests for gun possession, more sophisticated computer-aided analysis of crime patterns, more aggressive crime prevention. In the Seven-Five, Mezzadri has a team of officers who go around and break up the groups of young men who congregate on street corners, drinking, getting high, and playing dice-and so remove what was once a frequent source of violent confrontations. He says that he has stepped up random "safety checks" on the streets, looking for drunk drivers or stolen cars. And he says that streamlined internal procedures mean that he can now move against drug-selling sites in a matter of days, where it used to take weeks. "It's aggressive policing," he says. "It's a no-nonsense attitude. Persistence is not just a word, it's a way of life."

All these changes make good sense. But how does breaking up dice games and streamlining bureaucracy cut murder rates by two-thirds? Many criminologists have taken a broader view, arguing that changes in crime reflect fundamental demographic and social trends-for example, the decline and stabilization of the crack trade, the aging of the population, and longer prison sentences, which have kept hard-core offenders off the streets. Yet these trends are neither particularly new nor unique to New York City; they don't account for why the crime rate has dropped so suddenly here and now. Furthermore, whatever good they have done is surely offset, at least in part, by the economic devastation visited on places like Brownsville and East New York in recent years by successive rounds of federal, state, and city social-spending cuts.

It's not that there is any shortage of explanations, then, for what has happened in New York City. It's that there is a puzzling gap between the scale of the demographic and policing changes that are supposed to have affected places like the Seven-Five and, on the other hand, the scale of the decrease in crime there. The size of that gap suggests that violent crime doesn't behave the way we expect it to behave. It suggests that we need a new way of thinking about crime, which is why it may be time to turn to an idea that has begun to attract serious attention in the social sciences: the idea that social problems behave like infectious agents. It may sound odd to talk about the things people do as analogous to the diseases they catch. And yet the idea has all kinds of fascinating implications. What if homicide, which we often casually refer

to as an epidemic, actually is an epidemic, and moves through populations the way the flu bug does? Would that explain the rise and sudden decline of homicide in Brooklyn North?

2.

When social scientists talk about epidemics, they mean something very specific. Epidemics have their own set of rules. Suppose, for example, that one summer a thousand tourists come to Manhattan from Canada carrying an untreatable strain of twenty-four-hour flu. The virus has a two-per-cent infection rate, which is to say that one out of every fifty people who come into close contact with someone carrying it catches the bug himself. Let's say that fifty is also exactly the number of people the average Manhattanite-in the course of riding the subways and mingling with colleagues at work-comes into contact with every day. What we have, then, given the recovery rate, is a disease in equilibrium. Every day, each carrier passes on the virus to a new person. And the next day those thousand newly infected people pass on the virus to another thousand people, so that throughout the rest of the summer and the fall the flu chugs along at a steady but unspectacular clip.

But then comes the Christmas season. The subways and buses get more crowded with tourists and shoppers, and instead of running into an even fifty people a day, the average Manhattanite now has close contact with, say, fifty-five people a day. That may not sound like much of a difference, but for our flu bug it is critical. All of a sudden, one out of every ten people with the virus will pass it on not just to one new person but to two. The thousand carriers run into fifty-five thousand people now, and at a two-per-cent infection rate that translates into eleven hundred new cases the following day. Some of those eleven hundred will also pass on the virus to more than one person, so that by Day Three there are twelve hundred and ten Manhattanites with the flu and by Day Four thirteen hundred and thirty-one, and by the end of the week there are nearly two thousand, and so on up, the figure getting higher every day, until Manhattan has a full-blown flu epidemic on its hands by Christmas Day.

In the language of epidemiologists, fifty is the "tipping point" in this epidemic, the point at which an ordinary and stable phenomenon-a low-level flu outbreak- can turn into a public-health crisis. Every epidemic has its tipping point, and to fight an epidemic you need to understand what that point is. Take AIDS, for example. Since the late eighties, the number of people in the United States who die of AIDS every year has been steady at forty thousand, which is exactly the same as the number of people who are estimated to become infected with H.I.V. every year. In other words, AIDS is in the same self- perpetuating phase that our Canadian flu was in, early on; on the average, each person who dies of aids infects, in the course of his or her lifetime, one new person.

That puts us at a critical juncture. If the number of new infections

increases just a bit-if the average H.I.V. carrier passes on the virus to slightly more than one person-then the epidemic can tip upward just as dramatically as our flu did when the number of exposed people went from fifty to fifty-five. On the other hand, even a small decrease in new infections can cause the epidemic to nosedive. It would be as if the number of people exposed to our flu were cut from fifty to forty-five a day-a change that within a week would push the number of flu victims down to four hundred and seventy-eight.

Nobody really knows what the tipping point for reducing AIDS may be. Donald Des Jarlais, an epidemiologist at Beth Israel Hospital, in Manhattan, estimates that halving new infections to twenty thousand a year would be ideal. Even cutting it to thirty thousand, he says, would probably be enough. The point is that it's not some completely unattainable number. "I think people think that to beat AIDS everybody has to either be sexually abstinent or use a clean needle or a condom all the time," Des Jarlais said. "But you don't really need to completely eliminate risk. If over time you can just cut the number of people capable of transmitting the virus, then our present behavior-change programs could potentially eradicate the disease in this country."

That's the surprising thing about epidemics. They don't behave the way we think they will behave. Suppose, for example, that the number of new H.I.V. infections each year was a hundred thousand, and by some heroic aids- education effort you managed to cut that in half. You would expect the size of the epidemic to also be cut in half, right? This is what scientists call a linear assumption-the expectation that every extra increment of effort will produce a corresponding improvement in result. But epidemics aren't linear. Improvement does not correspond directly to effort. All that matters is the tipping point, and because fifty thousand is still above that point, all these heroics will come to naught. The epidemic would still rise. This is the fundamental lesson of nonlinearity. When it comes to fighting epidemics, small changes-like bringing new infections down to thirty thousand from forty thousand-can have huge effects. And large changes-like reducing new infections to fifty thousand from a hundred thousand-can have small effects. It all depends on when and how the changes are made.

The reason this seems surprising is that human beings prefer to think in linear terms. Many expectant mothers, for example, stop drinking entirely, because they've heard that heavy alcohol use carries a high risk of damaging the fetus. They make the perfectly understandable linear assumption that if high doses of alcohol carry a high risk, then low doses must carry a low- but still unacceptable-risk. The problem is that fetal-alcohol syndrome isn't linear. According to one study, none of the sixteen problems associated with fetal-alcohol syndrome show up until a pregnant woman starts regularly consuming more than three drinks a day. But try telling that to a neurotic nineties couple.

I can remember struggling with these same theoretical questions as a

child, when I tried to pour ketchup on my dinner. Like all children encountering this problem for the first time, I assumed that the solution was linear: that steadily increasing hits on the base of the bottle would yield steadily increasing amounts of ketchup out the other end. Not so, my father said, and he recited a ditty that, for me, remains the most concise statement of the fundamental nonlinearity of everyday life: Tomato ketchup in a bottle-None will come and then the lot'll

3.

What does this have to do with the murder rate in Brooklyn? Quite a bit, as it turns out, because in recent years social scientists have started to apply the theory of epidemics to human behavior. The foundational work in this field was done in the early seventies by the economist Thomas Schelling, then at Harvard University, who argued that "white flight" was a tipping-point phenomenon. Since that time, sociologists have actually gone to specific neighborhoods and figured out what the local tipping point is. A racist white neighborhood, for example, might empty out when blacks reach five per cent of the population. A liberal white neighborhood, on the other hand, might not tip until blacks make up forty or fifty per cent. George Galster, of the Urban Institute, in Washington, argues that the same patterns hold for attempts by governments or developers to turn a bad neighborhood around. "You get nothing until you reach the threshold," he says, "then you get boom."

Another researcher, David Rowe, a psychologist at the University of Arizona, uses epidemic theory to explain things like rates of sexual intercourse among teen-agers. If you take a group of thirteen-year-old virgins and follow them throughout their teen-age years, Rowe says, the pattern in which they first have sex will look like an epidemic curve. Non-virginity starts out at a low level, and then, at a certain point, it spreads from the precocious to the others as if it were a virus.

Some of the most fascinating work, however, comes from Jonathan Crane, a sociologist at the University of Illinois. In a 1991 study in the American Journal of Sociology, Crane looked at the effect the number of role models in a community-the professionals, managers, teachers whom the Census Bureau has defined as "high status"-has on the lives of teen-agers in the same neighborhood. His answer was surprising. He found little difference in teen-pregnancy rates or school-dropout rates in neighborhoods with between forty and five per cent of high-status workers. But when the number of professionals dropped below five per cent, the problems exploded. For black school kids, for example, as the percentage of high- status workers falls just 2.2 percentage points-from 5.6 per cent to 3.4 per cent-dropout rates more than double. At the same tipping point, the rates of childbearing for teen-age girls-which barely move at all up to that point-nearly double as well.

The point made by both Crane and Rowe is not simply that social problems are contagious-that non-virgins spread sex to virgins and that

when neighborhoods decline good kids become infected by the attitudes of dropouts and teen-age mothers. Their point is that teen-age sex and dropping out of school are contagious in the same way that an infectious disease is contagious. Crane's study essentially means that at the five-per-cent tipping point neighborhoods go from relatively functional to wildly dysfunctional virtually overnight. There is no steady decline: a little change has a huge effect. The neighborhoods below the tipping point look like they've been hit by the Ebola virus.

It is possible to read in these case studies a lesson about the fate of modern liberalism. Liberals have been powerless in recent years to counter the argument that their policy prescriptions don't work. A program that spends, say, an extra thousand dollars to educate inner-city kids gets cut by Congress because it doesn't raise reading scores. But if reading problems are nonlinear the failure of the program doesn't mean-as conservatives might argue-that spending extra money on inner-city kids is wasted. It may mean that we need to spend even more money on these kids so that we can hit their tipping point. Hence liberalism's crisis. Can you imagine explaining the link between tipping points and big government to Newt Gingrich? Epidemic theory, George Galster says, "greatly complicates the execution of public policy. . . . You work, and you work, and you work, and if you haven't quite reached the threshold you don't seem to get any payoff. That's a very tough situation to sustain politically."

At the same time, tipping points give the lie to conservative policies of benign neglect. In New York City, for example, one round of cuts in, say, subway maintenance is justified with the observation that the previous round of cuts didn't seem to have any adverse consequences. But that's small comfort. With epidemic problems, as with ketchup, nothing comes and then the lot'll.

4.

Epidemic theory, in other words, should change the way we think about whether and why social programs work. Now for the critical question: Should it change the way we think about violent crime as well? This is what a few epidemiologists at the Centers for Disease Control, in Atlanta, suggested thirteen years ago, and at the time no one took them particularly seriously. "There was just a small group of us in an old converted bathroom in the sub- subbasement of Building Three at C.D.C.," Mark L. Rosenberg, who heads the Centers' violence group today, says. "Even within C.D.C., we were viewed as a fringe group. We had seven people and our budget was two hundred thousand dollars. People were very skeptical." But that was before Rosenberg's group began looking at things like suicide and gunshot wounds in ways that had never quite occurred to anyone else. Today, bringing epidemiological techniques to bear on violence is one of the hottest ideas in criminal research. "We've got a hundred and ten people and a budget of twenty-two million dollars," Rosenberg says. "There is interest

in this all around the world now."

The public-health approach to crime doesn't hold that all crime acts like infectious disease. Clearly, there are neighborhoods where crime is simply endemic-where the appropriate medical analogy for homicide is not something as volatile as aids but cancer, a disease that singles out its victims steadily and implacably. There are, however, times and places where the epidemic model seems to make perfect sense. In the United States between the early sixties and the early seventies, the homicide rate doubled. In Stockholm between 1950 and 1970, rape went up three hundred per cent, murder and attempted murder went up six hundred per cent, and robberies a thousand per cent. That's not cancer; that's aids.

An even better example is the way that gangs spread guns and violence. "Once crime reaches a certain level, a lot of the gang violence we see is reciprocal," Robert Sampson, a sociologist at the University of Chicago, says. "Acts of violence lead to further acts of violence. You get defensive gun ownership. You get retaliation. There is a nonlinear phenomenon. With a gang shooting, you have a particular act, then a counter-response. It's sort of like an arms race. It can blow up very quickly."

How quickly? Between 1982 and 1992, the number of gang-related homicides in Los Angeles County handled by the L.A.P.D. and the County Sheriff's Department went from a hundred and fifty-eight to six hundred and eighteen. A more interesting number, however, is the proportion of those murders which resulted from drive-by shootings. Between 1979 and 1986, that number fluctuated, according to no particular pattern, between twenty-two and fifty-one: the phenomenon, an epidemiologist would say, was in equilibrium. Then, in 1987, the death toll from drive-bys climbed to fifty-seven, the next year to seventy-one, and the year after that to a hundred and ten; by 1992, it had reached two hundred and eleven. At somewhere between fifty and seventy homicides, the idea of drive-by shootings in L.A. had become epidemic. It tipped. When these results were published last fall in the Journal of the American Medical Association, the paper was entitled "The Epidemic of Gang-Related Homicides in Los Angeles County from 1979 Through 1994." The choice of the word "epidemic" was not metaphorical. "If this were a disease," H. Range Hutson, the physician who was the leading author on the study, says, "you would see the government rushing down here to assess what infectious organism is causing all these injuries and deaths."

Some of the best new ideas in preventing violence borrow heavily from the principles of epidemic theory. Take, for example, the so-called "broken window" hypothesis that has been used around the country as the justification for cracking down on "quality of life" crimes like public urination and drinking. In a famous experiment conducted twenty-seven years ago by the Stanford University psychologist Philip Zimbardo, a car was parked on a street in Palo Alto, where it sat untouched for a week.

At the same time, Zimbardo had an identical car parked in a roughly comparable neighborhood in the Bronx, only in this case the license plates were removed and the hood was propped open. Within a day, it was stripped. Then, in a final twist, Zimbardo smashed one of the Palo Alto car's windows with a sledgehammer. Within a few hours, that car, too, was destroyed. Zimbardo's point was that disorder invites even more disorder-that a small deviation from the norm can set into motion a cascade of vandalism and criminality. The broken window was the tipping point.

The broken-window hypothesis was the inspiration for the cleanup of the subway system conducted by the New York City Transit Authority in the late eighties and early nineties. Why was the Transit Authority so intent on removing graffiti from every car and cracking down on the people who leaped over turnstiles without paying? Because those two "trivial" problems were thought to be tipping points-broken windows-that invited far more serious crimes. It is worth noting that not only did this strategy seem to work-since 1990, felonies have fallen more than fifty per cent-but one of its architects was the then chief of the Transit Police, William Bratton, who was later to take his ideas about preventing crime to the city as a whole when he became head of the New York Police Department.

Which brings us to North Brooklyn and the Seventy- fifth Precinct. In the Seven-Five, there are now slightly more officers than before. They stop more cars. They confiscate more guns. They chase away more street-corner loiterers. They shut down more drug markets. They have made a series of what seem, when measured against the extraordinary decline in murders, to be small changes. But it is the nature of nonlinear phenomena that sometimes the most modest of changes can bring about enormous effects. What happened to the murder rate may not be such a mystery in the end. Perhaps what William Bratton and Inspector Mezzadri have done is the equivalent of repairing the broken window or preventing that critical ten or fifteen thousand new H.I.V. infections. Perhaps Brooklyn-and with it New York City-has tipped.

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