Knowledge-Based Policing: India and the Global Revolution in Crime Prevention

Lawrence W. Sherman*

The past three decades have witnessed a global revolution in the development and application of the prevention sciences, notably in health, transportation, and public safety. That revolution has saved countless lives that would otherwise have been lost to disease, plane crashes, murders and other tragedies. This revolution is strongest in the methods for creating new knowledge, but remains uneven in applying new knowledge. By initiating its global mid-career training programme for police executives, the Indian Police Service will foster both the production and the application of powerful new knowledge about the prevention of crime. Central to this effort is the science of criminology, which the Cambridge University has nurtured for over half a century as a multi-disciplinary creator of empirical knowledge within the Faculty of Law. The application of criminology to crime prevention is equal in complexity to the application of biology to medicine. Only when this complexity is fully appreciated by both public and police will the public invest more in knowledge-based policing, as the most cost-effective means of sustaining human liberty in our globally diverse societies.

INTRODUCTION

I cannot speak about policing in India this week without remembering the deaths of over eighty police just since last Sunday, in the long struggle with the Naxalites. In all of U.S. history, no more than 131 police have ever been killed intentionally in a single year across the entire nation. The scale of loss to the families of these Indian public servants is almost unimaginable, and my thoughts are with them.

There is indeed much to deplore in what some may call our current point in history: the age of terrorism. Yet we must also accept that our lifetimes have witnessed the enormous benefits of an age of prevention.

I. An Age of Prevention

In 1991, for example, there were 812 new cases of polio diagnosed in Tamil Nadu. Ten years later, there were none.

In 2008, there were fewer road deaths in the United Kingdom than in any year since 1926, when only the very few owned automobiles. After peaking at 8,000 in

* Ph.D. (Yale), M.A. (Cantab, Pennsylvania, Yale, Chicago), B.A. (Denison). Author is the Wolfson Professor of Criminology and Director of the Police Executive Programme at Cambridge University. He is also a Distinguished University Professor at the University of Maryland, USA. This lecture was organized by the Centre for Penology, Criminal Justice and Police Studies of JGLS on April 8, 2010.

1966, deaths on British highways dropped to just 2500 two years ago. Deaths per person-mile travelled have dropped more than ninety-five percent since records began.

Similarly, worldwide deaths from commercial airline crashes dropped from peak of 3,200 in 1972 to just 884 in 2008, despite a huge increase in the number of passengers flying.

The reduction in death by murder in the United States has been equally remarkable. In New York City alone, murders dropped from 2,262 in 1990 to under 500 in 2009—a seventy-eight percent drop.

The point is not that life expectancy is increasing equally all over the world. It is not. These examples merely show what is possible, not what is inevitable. It is possible because of what we know how to do, but not necessarily what we will do.

When American doctors who don’t wash their hands kill an estimated 247 patients each day from infections, those deaths are not due to a lack of knowledge. Global knowledge linking hand-washing to the prevention of death has existed since the 1840s. What kills those patients is the doctor’s failure — or refusal — to apply knowledge that she already has.

Thus the age of prevention, wherever it is flourishing, is made remarkable by two achievements. One is that so much more knowledge has been created. The other is that more knowledge has been applied. Indeed, creating more knowledge about how to foster the application of knowledge has become one of the hottest areas of research. From medicine to airplane safety engineering, basic tools such as checklists have been refined and polished to prevent thousands of deaths a year. These refinements, in turn, have been helped by advances in statistical tools that increase the knowledge we can derive from the growing volume of data made possible by the growth of information technology.

\[\text{Figure 1: The Cochrane Collaboration Logo}\]

The prevention revolution is vividly illustrated by the logo of one of its leading organization, the Cochrane Collaboration. This global medical organization has 27,000 contributors in over 100 countries, working together to synthesize and apply the most up-to-date medical knowledge available. This globalization of medical knowledge began only in 1992, with support from the National Health

\[1. \text{This logo is available at http://www.cochrane.org/}.\]
Service in the United Kingdom. Since then it has published over 2000 systematic reviews of what we know about the relative effectiveness of medical interventions. These reviews are read by doctors, nurses, and patients and their families all over the world. They have helped to save lives, not only by applying knowledge, but by using new tools to reveal discoveries that were not immediately obvious without globalization.

**Meta-Analysis:** What their logo shows is a statistical tool called a meta-analysis. The data embedded in the logo are the results from seven clinical trials of a drug that prevented deaths caused by predictably premature births. Only two of the findings were statistically significant, which meant that five of the results could have been due to chance. But the rules on statistical significance were written for analyzing just one study at a time.

The advantage of a meta-analysis is that it combines all of the studies of the same drug, whether the studies were done in New Delhi, London, New York, or Tokyo. It then asks what the average effect of the treatment was. Most important, it asks whether the overall pattern of effects was likely to have been due to chance, even if the individual findings were not discernible from chance results. What the meta-analysis showed for the drug being tested is that it clearly prevented deaths from premature births. The patterns were consistently in the direction of saving lives, and the consistency of seven out of seven results was very unlikely to be a mere coincidence.

These results were calculated from what is called a "forest plot." It derives its name from its usefulness as a means by which statisticians can help see the forest from the trees. Each tree is the result of one test, with a horizontal line showing the range of error around each comparison between patients who got the drug and patients who were randomly assigned to a control group. The average effect of all of the tests combined is shown in the shape of a diamond at the bottom of the graph. If this diamond is far enough away from the vertical line in the centre, that location means that the average effect of all studies combined is statistically significant. The further away the diamond is from the centre line, the bigger the benefit from the treatment — and in this case, the more lives saved.

It is only by medicine using such rigorous tests since the 1940s that polio has disappeared in Tamil Nadu, that tuberculosis deaths have plummeted, and that even HIV is under control on much of the globe. But it is only with the development of meta-analysis in the 1980s that we have learned more than we ever thought possible from randomized, clinical trials.

II. **GLOBALIZING CRIME PREVENTION**

By now you may be asking yourself what all this has to do with policing. But the answer is no mystery. The connection is simple. In the late 1990s, medicine simply reached out to help criminology, education, and other social sciences
to apply the same methods to the prevention of crime, ignorance, and poverty. The founder of the Cochrane Collaboration, Sir Iain Chalmers, contacted a few of us who were already doing randomized controlled tests of crime prevention strategies, and told us what was going on in medicine. He convinced us that we could do all the bold experiments we wanted, but we still would not have sound knowledge without meta-analysis. The record of medical research was clear: only comprehensive efforts to synthesize research, and not just produce it, would help us to discover the most effective ways to prevent human suffering.

We were convinced. And so it came to pass that in early 2000, the Cochrane Collaboration's leaders came to a meeting at the University of Pennsylvania, where a new organization was founded. That organization was named the Campbell Collaboration, honouring the late, great statistician Donald T. Campbell. The organization may be found today at a website hosted by the Norwegian government, at www.campbellcollaboration.org. With volunteer social scientists on four continents, and translations into both Chinese and Japanese, Campbell has now published over twenty-five systematic research syntheses on crime prevention programs and practices, with many more under production. It also publishes research syntheses on educational methods and social service programs.

One good example of a Campbell Collaboration synthesis was published early this year.2 A research synthesis team led by criminologist Anthony Petrosino searched through thousands of documents to identify twenty-nine controlled field experiments with over 7,000 juveniles randomly assigned to be prosecuted in court or diverted from prosecution. Some of the juveniles had been arrested for serious offences. Most of them, however, committed the kinds of offences most typical of juveniles: minor to moderately serious crimes, including thefts and assaults. By assigning them at random to prosecution or diversion, the experiments controlled for any selection bias that might have prosecuted those more likely to repeat their crimes, while diverting those at lower risk of recidivism. The twenty-nine experiments, in other words, created a fair test of which strategy worked better to prevent crime.

The result was startling. Across all these experiments, with 7,000 juveniles, criminal prosecution was clearly shown to increase crime, not to prevent it. All the time and effort police, detectives and prosecutors put into bringing the cases to court had, on average, simply increased the frequency of offending by an average mean difference of .23 — a small effect but one not due to chance. While most of these studies were done in the United States, a quarter of them were done in Australia. Similarities in common law systems make such studies both globally relevant and globally produced.

---

<table>
<thead>
<tr>
<th>Study Name</th>
<th>Outcome</th>
<th>Statistics for each study</th>
<th>Std diff in means</th>
<th>Lower Limit</th>
<th>Upper Limit</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klein (1986)</td>
<td>First Effect-I</td>
<td>-1.031</td>
<td>-1.594</td>
<td>-0.467</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Baron &amp; Feeney (1976) 601</td>
<td>First Effect-I</td>
<td>-0.190</td>
<td>-0.330</td>
<td>-0.051</td>
<td>0.026</td>
<td></td>
</tr>
<tr>
<td>Dunford, et al. (1982) KC</td>
<td>First Effect-I</td>
<td>0.041</td>
<td>-0.391</td>
<td>0.443</td>
<td>0.841</td>
<td></td>
</tr>
<tr>
<td>Dunford, et al. (1982) NY</td>
<td>First Effect-I</td>
<td>-0.210</td>
<td>-0.567</td>
<td>0.147</td>
<td>0.248</td>
<td></td>
</tr>
<tr>
<td>Emshoff &amp; Blakely (1983)</td>
<td>First Effect-I</td>
<td>-0.500</td>
<td>-0.985</td>
<td>-0.014</td>
<td>0.044</td>
<td></td>
</tr>
<tr>
<td>Sherman, et al. (2000) JPP</td>
<td>First Effect-I</td>
<td>-0.070</td>
<td>-0.324</td>
<td>0.184</td>
<td>0.589</td>
<td></td>
</tr>
<tr>
<td>Sherman, et al. (2000) JPS</td>
<td>First Effect-I</td>
<td>-0.190</td>
<td>-0.529</td>
<td>0.149</td>
<td>0.272</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.232</td>
<td>-0.405</td>
<td>-0.059</td>
<td>0.006</td>
</tr>
</tbody>
</table>

Figure 2: Effects of Prosecution on Juvenile Delinquency

What is most important about these Campbell syntheses of research is that they will not remain unchanged. In prospect, authors are committed to updating their findings whenever new research might change the conclusion. In the case of the juvenile prosecution synthesis, which included my own experiments, I know that new findings will come out soon that might alter the overall results. But I also know that Dr. Petrosino will be diligent in revising his analysis to keep the research up-to-date and on the cutting edge of knowledge.

The Campbell Collaboration has not seen crime prevention yet globalized in its application. But it has seen the synthesis of existing knowledge globalized. To the extent possible with the rise of English as a universal language of science, the search for research evidence now extends to any nation on earth. As long as research meets high standards of quality and fairness, it must be included in the synthesis of all the research on the planet about a single research question. When that question confronts the expenditure of billions of Rupees in tax revenues—as for public prosecution—the global significance of globalized knowledge should be clear indeed.

III. KNOWLEDGE-BASED POLICING

There is no clearer example of the global revolution in crime prevention than in the growth of what can be called “knowledge-based policing.” All policing, of course, is based to some degree on knowledge, including facts established in courts of law under rules of evidence. What we mean by knowledge-based policing is something far more comprehensive and systematic than has ever gone before. Thus knowledge-based policing can be defined as an approach to police policy and practice that attempts to develop and test new and more effective ways of accomplishing old goals. Like continuous quality improvement in business management or medicine, knowledge-based policing does as much surveillance for new knowledge as it does for new criminals.

Knowledge-based policing includes what I defined in 1998 as “evidence-

3. Id. at 26.
based policing,” a strategy modelled on the tools of evidence-based medicine. Evidence-based policing has been taught for the last decade at the Federal Bureau of Investigation (FBI) Academy and for the past two years in the Cambridge Police Executive Programme. This strategy combines rigorous analysis of local police data with findings from research evidence published worldwide. It employs evidence to both predict and prevent crime. In general, this means using data on local offenders, victims and locations to predict crime, while using research evidence in deciding how best to prevent crime.

Evidence-based policing also uses fair evidence to evaluate police performance. It adjusts, for example, evaluations of police success in preventing crime in relation to the social factors causing crime. To the extent possible, this approach measures the value police add to the social conditions of their assigned areas, rather than rewarding them for being lucky in their assignments.

**Hot Spots Patrols:** The leading example of evidence-based policing is the concentration of police patrols on high-crime micro-locations called “hot spots” of crime. This is a strategy for urban areas, in which crime tends to be highly concentrated in a small number of places that attract distinctive kinds of human activity — including drinking, drug abuse, fighting, and thieving. Even five percent of these micro-areas can contribute over half of the crime in a city.

In an experiment with the Minneapolis Police Department in 1988, David Weisburd and I reported that doubling the frequency of intermittent police patrols cut crime by up to fifty percent relative to the control group. This did not require that police be present all the time. The substantial reduction in crime was produced by merely increasing police presence from seven percent of the time to fifteen percent. The measurement of police presence was provided not by police assigned to perform the patrols, but rather by independently assigned social scientists using stopwatches to count the minutes and seconds of police presence by location.

This experiment also used the statistical tools of clinical medicine. Exactly 110 independent high-crime locations were selected for the experiment, but only half were chosen at random to receive the additional patrols. Because random assignment cancels out most underlying differences between the two groups, any difference in the average crime rates between the two groups of hot spots can be attributed to the differences in the dosage of patrol.

One criticism of this research is that crimes or criminals may have been simply pushed around the corner, or down the street. The evidence for this hypothesis is now heavily against it. Crime prevention strategies focused on particular areas are more likely to reduce crime in surrounding as to increase it.

Perhaps the most interesting finding from the initial hot spots experiments

---

is what is now called the "Koper curve," after my doctoral student, Christopher Koper, who discovered the pattern.\(^5\)

![Figure 3: The Koper Curve](image)

His discovery suggested that the ideal time period for police to patrol a high-crime hot spot is between twelve and fifteen minutes. Any less time creates a high risk that crime will resume the minute police leave. But if they stay that long — and no longer — there is a “free bonus” of what I call “residual deterrence” that will keep crime down long after police leave. Staying beyond fifteen minutes does nothing to increase the length of time for residual deterrence, and is thus a waste of police resources. Thus twelve to fifteen minutes seem just right. Some police agencies now send their constables out with a daily list of “Koper patrols,” the name of which is a good example of how research has been transforming policing.

**Problem-Oriented Policing** ("POP"): Another well-tested strategy is problem-oriented policing, first suggested in 1979 by University of Wisconsin law professor Herman Goldstein\(^6\). This strategy focuses on patterns of crimes rather than individual incidents. This includes repeat crime hot spot locations, but it also includes types of offenders, crime victims, situations, and even modus operandi (such as home-invasion armed robberies).

The basic strategy is to analyze and alter the causes of the repeated crimes or incidents that comprise the pattern. Police are asked to study the components of the criminal events, identifying the weakest links in the chains of causation to be targeted for disruption. They may seek to revoke the licence of a pub to sell alcohol, which may be fuelling fights among the pub’s customers. They may ask a late-night store to restrict the amount of cash it keeps on hand, which may attract armed robbers. They may enforce laws against hotels renting rooms by the hour, which may be facilitating prostitution. Any and all of these activities can

---

be viewed as crime prevention, as distinct from law enforcement, but they are popularly known as "POP."

The POP strategy has been tested in five randomized experiments, four of which were completed at the time that Weisburd and his colleagues undertook a systematic review of the results for the Campbell Collaboration. The average result of those four experiments is displayed in Figure 4. The result is small but statistically significant. On average, POP succeeds in seeing greater reductions in crime problems than would have occurred without POP interventions, as measured by what happened in randomly assigned control problems.

Whether this means POP is cost-effective remains unknown, given the general lack of data on the costs of crimes prevented or the costs of police time to prevent them. As the field matures, cost data will likely become a more common feature of police experiments. In the meantime, police may be cautiously optimistic that investing in POP could save substantial money in the long run, as long as the people or places that are targeted by POP do not resume their criminal patterns as soon as the POP intervention is over. That means that long-term follow-up of POP experiments is vitally important, and should become an additional feature for getting the most out of these studies.

<table>
<thead>
<tr>
<th>Study Name</th>
<th>Statistics for each study</th>
<th>Std diff in means</th>
<th>Standard error</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman et al. 2000</td>
<td>0.192</td>
<td>0.135</td>
<td>0.155</td>
<td></td>
</tr>
<tr>
<td>Weisburd &amp; Green 1995</td>
<td>0.147</td>
<td>0.111</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Braga et al. 1999</td>
<td>0.143</td>
<td>0.076</td>
<td>0.060</td>
<td></td>
</tr>
<tr>
<td>Mazurek et al. 2000</td>
<td>0.137</td>
<td>0.077</td>
<td>0.075</td>
<td></td>
</tr>
<tr>
<td>Random effect</td>
<td>0.147</td>
<td>0.011</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 4: Mean Effect Sizes for Randomized Experiments**

**Evidence and Knowledge:** Such distinctions between evidence and knowledge will become increasingly important. Evidence is merely a set of facts, generally the most relevant facts available to help support a decision. Knowledge is an integration of diverse facts and evidence, an arguably better basis for understanding and action than evidence alone. Knowledge must be based on evidence, but evidence in isolation is not enough. Knowledge also requires a theory that integrates the evidence, a broader context in which to apply the theory, and a conceptual map of how different aspects of actions are connected.

Police may, for example, have evidence that stop-and-search tactics reduce...
gun crime. But if such stops also foster community hostility to the police, that
could reduce public willingness to help police make arrests and remove dangerous
offenders from communities. Most police actions have multiple consequences.
Experiments may only measure few of those consequences, one study at a time.
Knowledge-based policing must integrate what we know and what we don't know,
trying to find the best ways to deal with problems about which the evidence is
rarely complete or reliable.

It is also worth contrasting knowledge-based policing with “intelligence-led”
policing. There is a great value to having criminal tips, quantitative forecasting,
and other ways of predicting where and when crime is most likely to occur. There
are even major advances in such analysis that can enable police to predict who
will commit the next murder. Such predictions, which could be described as
intelligence, are just as central to evidence-based policing as the identification of
hot spots or repeat problems.

The uses intelligence can best serve, however, cannot be derived from the
intelligence itself. What action police should take when they produce such
forecasts is a decision that requires a broad range of knowledge. Such knowledge
must integrate law, history, culture, psychology, and sociology more generally in
order to develop a plan of action that anticipates everything that can possibly go
wrong, and takes as many steps as possible to avoid those possibilities.

All of this is easy to say in the abstract. In more concrete terms, there may be
many things done in the name of crime prevention that are actually increasing
crime — such as juvenile prosecution. The problem is that absent good evidence
testing these policies, there is no way to know whether these actions help or
harm communities. Yet for some things police do, disasters may become readily
Consider, for example, the immediate provocation of riots, or the death of an
innocent bystander during the G-20 protests in London on April 1, 2009. In
all such cases, the effectiveness of crime prevention can only be enhanced by
generating and applying more knowledge about the causes of crime and the
possible consequences of police methods for dealing with crime.

IV. INDIA AND THE GLOBAL REVOLUTION

India has been at the centre of many global revolutions in knowledge. From
the development of modern algebra in the Sixth Century BC to the invention of
sampling theory in the Twentieth Century AD, Indians have both created
and applied knowledge that became global. This lecture marks yet another such
occasion: the start of a robust initiative by the Indian Police Service (“IPS”) to
generate and apply global knowledge for local problems.

8. Richard Berk, Lawrence Sherman, Geoffrey Barnes, Ellen Kurz & Lindsay Ahlman, Forecasting Murder
Within a Population of Probationers and Parolees: A High Stakes Application of Statistical Learning, 172 J.
JRSSABerk.pdf.
That initiative is called the Mid-Career Training Programme. It is funded by the Home Ministry in three phases, based on length of service. Following the first two phases of initial recruit training, Phase III is offered to IPS officers who have served some seven to ten years. The first cohort of 150 IPS officers in that class began six weeks of instruction this week at the S.V. Patel National Police Academy in Hyderabad, to be followed by a two-week study tour of Australian Police. The Phase III training is jointly offered by the Australian Graduate School of Policing, the United Kingdom's Bramshill Police College, and the Indian Institute of Management.

IPS officers with fourteen to sixteen years experience are eligible for the Phase IV training provided by the Cambridge University Police Executive Programme, which I direct, in collaboration with the Jindal Global Law School of O.P. Jindal Global University. This course begins next November in Hyderabad, and ends with two weeks study at the Cambridge Institute of Criminology. A fifth Phase will be offered to officers with twenty-five years experience by the Indian Business School and the London Business School.

Each of the three phases will pursue different objectives and mission. Speaking only for Phase IV, I can assure you that our task is to link Indian policing to the most relevant, useful, and inspirational global knowledge we can find. From experiments to extremism, from predictions to paradigms, we will explore all the new intellectual territory of policing from overseas, and then bring it right back to India in daily discussion groups. Jointly taught by senior academics of global renown, such as Australia's John Braithwaite and Britain's Sir Anthony Bottoms, and leading police executives from the United Kingdom and the United States, such as former London Police Commissioner Sir Ian Blair, the course will require a reading list that is broad on ideas and deep on knowledge-based policing.

Since 1861, the Indian Police have operated on globally-applied principles of English Common Law. Since 1947, the IPS has operated one of the most competitive systems in the world for selection of officers on the basis of merit. It has also operated one of the most extensive programmes of recruit training, incorporating a wide range of knowledge into its widely diverse work.

Today the IPS faces new challenges, from within and without. An increasingly middle-class population will make new demands on their police, subjecting them to closer scrutiny than ever before. At a time when global popularity ratings are applied to everything from movies to universities, the Indian Police will find it hard to avoid the new "report card" system of annually rating every police force in England and Wales on a wide range of subjects. The demand will be to perform ever better, and not to rest on the laurels of past accomplishments.

That is the context in which we will offer what we know about the global revolution in crime prevention. We do not pretend to have any great knowledge of India or its problems, nor of its police institutions. All we can offer is the emerging consensus about the complex requirements for effective policing in
diverse societies. We can also help to promote public understanding of the truth that policing is more about brains than brawn. At its best, policing is as nuanced as a symphony, and as delicate as heart surgery. It requires an astounding breadth of knowledge in a unique combination of subjects, from chemistry to languages.

At the core of policing, however, there will always be criminology. As a multi-disciplinary field itself, criminology addresses three questions with the best answers it can find. Those questions, as defined Edwin H. Sutherland in the last century are as follows:

1. Why are some behaviours banned, but not others, sometimes irrespective of the actual harm they cause?

2. What explains and predicts law-breaking?

3. What explains and predicts the differential effects of responses to law-breaking, from crime prevention to punishment and treatment?

The search for better answers to these questions, using far better research methods, forms the core of the global revolution in crime prevention. This week, India has joined ranks with the global police connection to the discipline of criminology. While our expectations for education and training must always be modest, the evidence is on our side. For whether change is rapid or long in coming, the record is very favourable on education as a force for change.

It is a great honor for an American to have the opportunity to be part of this milestone in India, and to work with the Indian Police Service. It is a great honour for Cambridge University to be able to work in partnership with a boldly innovative institution in the O.P. Jindal Global University, as well as with the immensely prestigious Indian Police Service. The honour is, in fact, exceeded only by the challenges. We have much hard work ahead, and we shall be closely allied in accomplishing it. We thank you for coming today, and will welcome any and all suggestions you may have to offer for our work.