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MANUSCRIPT DETAILS

TITLE: Investigating Homicide: Back to the Future

ABSTRACT:

In this article we suggest two things. First, that the scientific and technological developments and increased regulation that have shaped homicide investigations in England and Wales over the last few decades, have provided today's investigators with opportunities not available to their predecessors, and play a key role in solving unsolved homicides. Second, however, we suggest that such developments have created new challenges for investigators, challenges that impede current investigations, potentially creating our future unsolved cases.

This paper draws on two qualitative studies that comprised over 8 months of ethnographic research, observations, interviews with serving and retired homicide detectives and case file analysis.

The widespread changes to homicide investigations in England and Wales have been valuable in many respects, notably, they have allowed detectives to look back in time and bring longstanding unsolved cases to a close. However, change, although well intentioned, might actually be creating future cold cases as detectives endeavour to manage the volume of information now generated during investigations, fast evolving scientific and technological techniques and an increase in bureaucracy.

Improving investigative practice

Learning from change

Reducing unsolved homicides versus a rise in new cold cases

Innovative and entrepreneurial investigators

Utilising qualitative research, this paper contributes to the academic literature exploring homicide investigation in England and Wales, offering insight into the challenges facing detectives and the potential impact of these upon solving past and present homicide cases.

Investigating homicide: Back to the future

Purpose:

In this article we suggest two things. First, that the scientific and technological developments and increased regulation that have shaped homicide investigations in England and Wales over the last few decades, have provided today's investigators with opportunities not available to their predecessors, and play a key role in solving unsolved homicides. Second, however, we suggest that such developments have created new challenges for investigators, challenges that impede current investigations, potentially creating our future unsolved cases.

Methodology:

This paper draws on two qualitative studies that comprised over 8 months of ethnographic research, observations, interviews with serving and retired homicide detectives and case file analysis.

Findings:

The widespread changes to homicide investigations in England and Wales have been valuable in many respects, notably, they have allowed detectives to look back in time and bring longstanding unsolved cases to a close. However, change, although well intentioned, might actually be creating future cold cases as detectives endeavour to manage the volume of information now generated during investigations, fast evolving scientific and technological techniques and an increase in bureaucracy.

Originality/value:

Utilising qualitative research, this paper contributes to the academic literature exploring homicide investigation in England and Wales, offering insight into the challenges facing detectives and the potential impact of these upon solving past and present homicide cases.

Keywords:

Homicide investigation, cold cases, detective work, qualitative research.

Type:

Research paper.

Introduction:

Over the past few decades homicide investigations have been subject to significant change. The origins of many developments can be traced back to the 1981 Byford Inquiry that followed the investigation into the crimes of Peter Sutcliffe, the Yorkshire Ripper. The inquiry established, among other things, the need to review investigations, ensure more effective management of information and enhance accountability. The inquiry's extensive recommendations have "governed all major crime investigations since" (Brain 2010, p36). This, however, was just the beginning and the years that have followed have seen continuous reform of homicide investigation, reforms that have also impacted upon the very nature of detective work itself, which has evolved from being considered a craft, learned on the job with detectives drawing on experience, intuition and hunches, to a professional and scientific mode of investigation (Tong and Bowling 2006; Innes 2010, James 2013, O'Neill 2018). Of course, the changes outlined below have taken place alongside a range of other major shifts including financial, organisational, political and cultural that have affected the police service as a whole, but which there is no space to discuss. The focus here is on the impact of changes in science and technology, in combination with increased regulation, on the way investigations are conducted and to some extent on their outcomes.

One of the most influential developments that followed the Byford Inquiry was the introduction of the Home Office Large Major Enquiry System (HOLMES), a computerised system designed to hold and manage the information generated during major crime investigations (Stelfox, 2008). Information coming in to an investigation had been held on an index card system making the sharing and managing of information difficult. This was shown during the Yorkshire Ripper investigation when several chances to identify the suspect were missed as a consequence of such issues. Since the introduction of HOLMES, we have seen an

exponential growth in the use of science and technology in investigations, especially mobile phone analysis; Automated Number Plate Recognition (ANPR); CCTV cameras and computer analysis. The introduction of the National DNA Database (NDNAD) in 1995, along with progressive developments in scientific techniques and technologies, enabling DNA profiles to be established from ever-smaller amounts of biological material, has increased opportunities for offenders to be identified, linked to, and eliminated from, crimes. As Stelfox (2009, p35) notes, developments such as those outlined here, have gifted "investigators with sources of materials that their predecessors could only dream of".

The early 1980s saw not only major technological development in major crime investigation, but also changes to its regulation. The introduction of the Police and Criminal Evidence Act (PACE) 1984, was the first significant development in legislation which endeavoured to provide the police with more powers, whilst affording suspects additional rights. This was a seismic change in legislation governing investigations designed to prevent miscarriages of justice caused by police malpractice. Further legislation followed with the introduction of the Criminal Procedures and Investigations Act (CPIA) 1996, the Regulation of Investigatory Powers Act (RIPA) 2000, and more recently the Investigatory Powers Act (2016) all designed to regulate investigative procedures. As Loftus (2009, p26) writes "contemporary police officers work in a substantially different legal context than previous generations". Added to this, there has been a multiplication of guidance governing investigations, most notably the Major Incident Room Standard Administrative Procedures (MIRSAP), the Murder Investigation Manual (MIM), the Core Investigative Doctrine and Approved Professional Practice, which were all designed to support detectives and standardise investigations. Investigations and investigative work has consequently changed from being a craft, learned on the job, where investigations held no special status and no specialist training was given (Stelfox, 2009) to a professional process with detectives being trained through the Professionalising Investigations Programme (PIP), designed to improve investigative practice and provide cradle to grave training for detectives (James, 2013; James and Mills, 2012).

Given the extent of change one might expect that all homicides are now solved, or at least the number of unsolved homicides declining. Yet, the number of homicide

detections appears to have reduced (Brookman *et al.,* 2018). While it is problematic to make comparisons between very recent homicide clear up rates with an older one, because clear up rates change as people are caught which can take up to a year or more, there does appear to have been a drop. Based on Freedom of Information requests The Guardian report that in 2010/2011 83% of homicides were solved whereas it had fallen to 67% in 2017/2018 (Dodd, 2019). There are many and varied causes of homicide investigative failure and it is not our intention to reproduce the growing amounts of literature on this (see Rossmo 2008; Innes 2003; Nicol *et al* 2004; Roycroft 2008; Stelfox 2009), rather, in the section that follows, we briefly summarise some of the literature, which indicate that change has posed new challenges for investigators.

The Impact of Scientific and Technological Change

The present literature reveals that the effectiveness of scientific and technological tools is open to debate (Williams, 2017). As early as 1986 Ericson and Shearing suggested the scientification of police work linked to the growing uses found for science and technology in investigations. Conversely, other studies suggest that DNA is rarely a factor in case clearance (Ericsson 1993; McCartney 2006; Schroeder and White 2009; Brodeur 2010; Brown and Keppel 2012). To illustrate, Schroeder and White (2009) focusing on the use of DNA in homicide investigations in Manhattan over a seven year period, found that in just over half of the cases in their sample DNA evidence was not collected. Moreover, in only 40 cases, 6.7% of their sample, was DNA evidence used in the homicide investigation prior to the arrest of a suspect (Schroeder and White 2009, p326). On the other hand, Roycroft (2007) found that such evidence played a significant role in homicide investigations. In the majority of cases he examined, forensic material contributed to the solution in 38% of cases, phone analysis in 25% and CCTV in 21.7% (Roycroft, 2007).

A possible over reliance on such techniques has also been recognised. McCartney (2006, p184) found that the police can be “blinded by their own science”, believing that when a case has forensic evidence it does not require a thorough investigation. However, exploring the reliance on science and detective skills in relation to the investigation of cold cases, Allsop (2018) found that the two worked hand in hand and that detective skills are necessary in ensuring the efficient use of science and

technology. Alternatively, Brookman *et al* (2018) found that with the progression of science and technology, traditional detective skills have diminished, with interviewees describing how shortcuts were sometimes taken because of advances in this field. Furthermore, published audits consistently highlight a poor knowledge of forensic science in the police service, including in homicide investigations (Fraser, 2007) and forensics has been identified as one of the main areas of failure in homicide reviews (Nicol *et al*., 2004).

One area in which there appears to be little dispute is that advances in science and technology generate masses of information that must now be managed. Innes (2003, p255) discussed the challenges of managing information during homicide investigations suggesting that this "may result in officers simply working to get the data on the system, rather than maintaining a critical eye and carefully assessing its value to the investigation". Extensive developments in science and technology may exacerbate such issues. This is supported by Westera *et al* (2016, p202) who identified managing information as a challenge: "detectives' main concerns about analysing the large amounts of technology-generated information were that this process was time-consuming and prolonged the investigation and added to an already heavy workload". Moreover, detectives in their study, felt that they needed persistent training to keep up with expansions in technology. Her Majesty's Inspectorate of Constabulary (HMIC) (2017, p15) found that keeping up with advancing technology was becoming difficult for police services to exploit digital investigative opportunities when they do not have the capacity to do so. This has also been seen more recently with a number of cases collapsing because of a failure to adequately review and disclose digital data, in particular in allegations of sexual violence.

The Impact of Increased Regulation

It is not just the proliferation of science and technology that has caused new challenges for those investigating homicide. Fox (2014, p13) suggests that the increase of legislation and guidance documents' limits detective innovation and flair, finding that such guidance might create a 'tick box' and risk adverse mentality. In 2017 the Police Federation observed that bureaucracy in policing that is preventing

them from performing effectively (Marsh, 2017). Westera *et al* (2016) noted similarly that onerous bureaucracy is hindering investigations.

Added to this, the advent of New Public Management (NPM) models of policing with increased accountability, performance targets and a focus on finding ways to improve clear up rates has led to what has been described as the 'McDonaldisation' of policing, which has resulted in "an increase in bureaucracy, a reduction in police discretion and deskilling" (Heslop 2011 p319). There is evidence of similar consequences in homicide investigations. Brookman and Innes (2013) contend that the drive for accountability has led to a raft of new policies and procedures, resulting in an increased importance being placed on procedural success during homicide investigations such that, regardless of the ultimate outcome, an investigation is considered successful if policies and procedures have been successfully managed.

Bringing together the growth in science, technology and regulation, and the problems these have created Ericson and Haggerty (1997) note how growing technological developments create further demands on police to manage the data this produces, such that much of their time is spent satisfying bureaucratic requirements. They contend that better technologies require greater expertise to manage the data produced but at the same time this is also stifling innovation (Ericson and Haggarty 1997). What will become clear is that our participants reinforced these findings in relation to homicide investigations especially the opportunities and challenges science, technology and regulation poses.

Methodology:

The data drawn on in this paper were originally collected for two separate doctoral studies conducted in England and Wales between 2009-2016. The cumulative data comprised eight months ethnographic observations of one major crime review team; observations of investigator training; case file analysis of live and cold case investigations spanning five decades and 28-day reviews of homicide investigations.

Semi-structured interviews provided much of the data that emerged from both studies. In total, 37 semi-structured interviews were held with both serving and retired detectives (nineteen serving and eighteen retired). The length of service ranged from one retired detective who joined in 1969 up to a serving detective who

joined in 2002. Many of the retired detectives were working within the police service as civilians at the time the data were collected, enabling the researchers to obtain a past and present perspective on homicide investigations. Ten of the interviewees were female and twenty-seven were male, which reflects the fact that historically males predominantly held the role of detective. The ranks of those interviewed ranged from Detective Constable to Detective Chief Inspector. Additionally, seven police force areas were represented (four in England and three in Wales). Interviews were also conducted with forensic scientists, a regional advisor, a lawyer and a civilian review officer.

Anonymity for all participants and police forces was assured and, for the purposes of this paper, we have noted whether the respondents were retired or serving detectives to maintain anonymity whilst allowing the reader to understand the interviewee's perspective. All interviews were recorded and transcribed verbatim, allowing the data to be thematically analysed and allow a "thick description" of the data to be developed (Braun and Clarke 2006, p37). The data gleaned through observations and case file analysis were also analysed thematically.

While the data was collected for two distinct studies, cross cutting themes emerged from both, especially the changing nature of homicide investigations and the opportunities and challenges these changes present. In the section that follows some of these findings are presented with a particular focus on science, technology and increased regulation

Findings:

With the backdrop now established, we suggest two things. First, that two of the main developments that have shaped homicide investigations over the last few decades, namely scientific and technological innovations and increased regulation, provide detectives with new lines of enquiry to pursue and play a key role in helping to solve previously unsolved homicides. Second, we suggest that such innovations may actually encumber current investigations, potentially creating our unsolved cases of the future.

Science and Technology: A Growing Toolkit

Historically, the scientific and technological tools that detectives could draw on during a homicide investigation were limited, however, this did not mean that these investigations were flawed. A review of an unsolved murder from the 1980s that was conducted in the early 2000s reported that:

> *"The initial investigation itself was thorough and left no obvious lines of enquiry outstanding"* (1980s Homicide Case File)

However, developments in this arena have been extensive and provide investigators with new opportunities as one of our serving detectives noted:

> *"The introduction of DNA evidence and the massive impact that's had, the use of CCTV evidence and the availability of that from a huge range of sources now, not just the cameras on the street, fire engines have got cameras, buses have got cameras on, everyone's got a camera on their phone. The use of telephony evidence is massive for us as well; from every inquiry from the simplest domestic murder, telephony is a line of inquiry that an SIO would pursue. So, there's lots there!"*

The introduction of DNA testing in particular was considered to have been especially influential and as one respondent said:

> *"The possibilities became endless overnight".*

Numerous examples of the opportunities that DNA and other technological advances have provided to investigators were identified, from being able to identify new lines of enquiry, to linking crimes, proving and disproving alibi's and being able to place a suspect at the crime scene, As one of our participants, a serving homicide detective, explained when considering the value of cell site analysis to investigations:

> *"It was the first time we convicted somebody on cell site analysis…he was already in custody for a no body murder…a critical blow to him would have been if we could have linked him to that site 40 miles away in the middle of nowhere…and we were able to show through cell site analysis that 24 hours before we found the body, he'd actually driven down exactly the deposition site"*

The data also revealed that these changes have helped to secure safer convictions:

> *"A lot of convictions in the past were based on confessions or false confessions or oppression whereas very often now the evidence now is far safer in terms of the technology that proves it"* (serving detective)

One of the ways in which these changes have proved to be invaluable is by looking back, with a fresh perspective at unsolved cases. That is cases which have gone undetected either because; an offender has not been detected or because there is insufficient evidence to connect the suspect to the crime. This also applies to miscarriages of justice, which result in the conviction being quashed and the investigation beginning again. A number of the developments previously outlined have enabled investigators to look again at these unsolved crimes. Most notably, advances in DNA profiling technologies have been pivotal to the success of cold case homicide investigations, especially in sexually motivated offences where the ability to create DNA profiles from items retained from the original investigation have helped to identify offenders and eliminate suspects (Allsop, 2018). Given the sheer volume of data collected during the original investigations this is considered necessary. As one serving detective noted:

> *"DNA is the only way forward in cold cases, it is a double edged sword as you get to rely on it and forget about how to do good old fashioned policing, but in a review without it, it would be difficult to know where to start when you have crates and crates of evidence to go through. It would take a year to get everything on computer to cross reference things and to decide which way to take it; with forensics it gives you a starting point"*

With each scientific advance smaller amounts of biological material and degraded samples can produce a DNA profile, providing new leads for investigators to follow as the following murder review case file notes highlight. At the time of the murder only blood grouping was available to potentially match or eliminate suspects to the crime but over thirty years later the offender was eventually identified through Familial DNA searching:

> *"Swabs containing semen were taken from the victim's mouth and vagina and semen on the hem of her trousers had been retained by the FSS. In 1996, an SGM profile was obtained from the semen; however, officers at that time were unable to confirm whether the semen found came from the same person. In 2003, a full DNA profile was obtained and placed on the NDNAD. During the subsequent review in 2009 the FSS advised that the swab taken from the victim's mouth could now also be upgraded, as testing had advanced sufficiently to allow for tests to be carried out on ever smaller samples. This upgrade confirmed that both sexual acts were by the same man. The full DNA profile from the semen matched a partial profile from the blood and enabled detectives to establish that the person who had raped her had also stabbed her and been injured in the process"* (Murder Case File Notes)

Familial DNA searching on the National DNA Database (NDNAD) has proved to be invaluable to live and cold case homicide detections. Familial DNA was first introduced by the then Forensic Science Service and enables an unknown offender to be identified through a close relative whose DNA profile is on the database. This technique has been successfully used in a number of cold case homicide detections including that of Christopher Hampton for the 1985 murder of Melanie Road in 2017, and Robert Morley for the 1985 murder of Imraan Vohra. Though Morley was deceased identifying him as the murderer meant the family could be informed and the investigation closed.

Science and Technology: A Silver Bullet?

However, a possible over-reliance on science and technology was identified. The potential repercussions of the over reliance on science becomes apparent from the following discussion with a serving detective when discussing a murder investigation that went cold:

> *"The SIO from day one, you can look through his decision-making, always thought that the forensic evidence was going to come in because of the nature of the attack, and it never did, and suddenly finds himself 6 months down the line thinking "where do I go now?""*

Further, when one retired detective, who still worked within the police service, was asked about developments in science and technology, he too suggested that it could be over relied on:

> *"What I think we may have lost is that SIOs very often rely on it when it's not there. So, I probably class myself as a little bit of an old fashioned SIO in many ways, in as much as, that some of the mistakes that I see are that they don't investigate it properly because they're always looking for the easy route"*

It was not just the over-reliance on science and technology that was identified as being potentially problematic, the impact created by the sheer volume of data science and technology can bring to investigations is summed up by this quote from a serving detective:

> *"There's an awful lot of data management which is now becoming a fundamental part of a murder inquiry"* (serving detective)

The masses of data that CCTV yields were often mentioned. The case file of a homicide from the 1990s describes that the CCTV footage obtained was:

> *"95 hours and it takes 2 days to view a 4-hour tape"* (1990s Homicide Case File)

Further, before this information can be examined, the participants explained that investigators must identify where the cameras are, obtain access to the footage and review them. Similarly, our participants highlighted the widespread use of mobile phones and the sophistication of handsets today, which also produce a large amount of data that must be handled as exemplified by the comments below from a serving homicide detective:

> *"Data storage is phenomenal, you have now on a phone what you'd have on a PC on your desk 30 years ago…If you download somebody's phone it could be 50,000 pages of A4 paper, so how do you get through all of that to extract the bits that you actually need, so there's challenges in dealing with the volume of data that is now available to us"*

Another one of our interviewees, a civilian officer, noted how technology could hinder investigations when the case goes to trial:

> *"Technology can be a disadvantage and, talking about one case in particular that I worked on which is a murder, which is, it was not detected but we're not looking for anybody else in connection with the investigation. It was at the time when telephony was coming to the fore and a presentation was put together at court of all the telephony, and it completely and utterly bamboozled the jury and I think as, because they used all sorts of statistics, they had somebody there that was statistics, so well, yes actually that phone could be there, but just because he's there and its pinging off that mast does not necessarily mean…. there was somebody within the jury who was some sort of, not an expert in it but he was some sort of, he had some specialism which, he was telling the others, it was on the balance of probabilities almost, he was saying by statistics, I think he was an expert on statistics, that that was not necessarily the case"*

Although scientific and technological developments over the years have undoubtedly been significant, other changes may mean that future developments in this area are stalled. Our data suggest that the 2012 closure of the Forensic Science Service (FSS) and a lack of government funding, have meant that England and Wales are no longer leading the way in developments in forensic science. It is feared that with the closure of the FSS innovations, such as those utilised in the cold case investigation mentioned in the previous section, may no longer occur, and the opportunity to detect cold cases reduced (Allsop 2018; Atkin and Roach 2015). Indeed, one scientist remarked that England and Wales have gone from:

"pioneer to nowhere near" (Fieldwork Notes)

Additionally, several serving homicide detectives expressed that maintaining pace with scientific and technological developments had become a challenge for the police service:

> *"We need to be on top of our game and we are not because we are lagging behind and every force is the same, because it is changing all the time…and we are lagging behind"*

When detectives were asked about why this might be, budgetary constraints were identified as a concern. Despite the resources provided for homicide investigations, investigators must now make difficult decisions about what exhibits are sent for testing, as a serving detective explained:

> *"It's not our inability to keep up with technology, it's working in increasingly reducing budgets, I mean even now you'd think that the police would have at their disposal an endless pot of money around forensic examinations, we can't just submit, we have to prioritise and assess what we submit, when we submit forensically. And a crime should never not be solved because you can't afford it, but the sad reality probably is that, some stuff never gets submitted because of the cost implications"*

Conversely the following discussion with a serving officer suggests why money will continue to be spent on cold case reviews. He was asked:

> *'Do you think your work is going to change because of the budget cuts?'*

He responded:

> *"They imply that it will but I'm not convinced of it, because whilst you do have to say yes - that we are not going to spend any more money - it's a brave person that stands up in a murder investigation and says 'that is it', now they might stand up and say we are not going to do anymore because realistically we're not going to get a result from it, but I do not think they'd stand up and say we're not going to get any more because we're not spending any money. We might say we will not spend the money because it does not justify the result, but if you thought that you were going to get a DNA profile from something for a murder that is going to lead you to the offender it's a brave individual that says I'm not going to spend that £3k. It takes a lot of justifying if they then commit another crime…If there is a justifiable need, and there really is quite a strong possibility, rather than a remote possibility, then I think the money could be found, if clearly it was going to solve a crime"*

Increased Regulation and Increased Professionalisation

Another area of change impacting investigations revealed by the data was the growth in legislation and guidance to regulate investigations. The introduction of the Police and Criminal Evidence Act (PACE) (1984) was considered to have been particularly influential:

> *"I think any investigation became more professional when PACE was introduced"* (retired detective)

Prior to its introduction, investigations were subject to minimal oversight with its predecessor, the Judges Rules, deemed inadequate:

> *"Judges' Rules meant to some degree that you had more, almost freelance in the way that you could do your own investigations"* (retired detective)

The Criminal Procedures Investigations Act (CPIA) (1996) and the Murder Investigation Manual (MIM) in particular were also considered to have been important developments. A retired homicide detective described how these have professionalised investigations:

> *"Having the MIM as a national strategic document as opposed to a load of old Sherlock Holmes type of characters, I think that made a difference…we started to take more of a strategic approach to investigation once the manual was put in place"*

It was also reported that such developments have helped to ensure that the mistakes of the past may be avoided:

> *"I think we have so many, the MIM, we've got our force policy, we've got so many laws that we didn't have back then: PACE, CPIA, all of the laws that regulate us, that you'd be hard pressed to say there'd be something that we'd be doing that was fundamentally wrong again"* (retired detective)

Certainly, changes to the interview process as a result of PACE were said to have been an important shift in how these were conducted, an important point when we consider that several miscarriages of justice have been attributed to interview practices (Savage and Milne, 2007):

> *"It's probably a much more professionalised and scientific approach to the way in which we interview now as to years ago when you just said, "you did didn't you? You did it didn't you?" until they just said that they did"* (serving detective)

Increased Regulation and an Increased Workload

The plethora of procedural guidance to be adhered to has, however, resulted in detectives seemingly becoming less entrepreneurial and innovative in their investigative thinking, losing the art of investigations, and becoming risk adverse:

> *"From first working on murders 17/18 years ago, I think we do too much, when you look at the amount of time and resources we put in and whether that's the legacy and things, which are still on-going, but I do think we've become risk averse"* (serving detective)

A legal practitioner interviewed also described investigative procedures today, as *"cumbersome, a bit bureaucratic"* and that there are now *"huge teams of people having to cover every eventuality with a paper trail that's bogging them down".* Furthermore, there was also a suggestion that the influx of legislation and guidance, as well as risk aversion, has stifled creativity and innovation amongst homicide detectives, a finding which resonates with the work of Ericson and Haggerty (1997), McCartney (2006), Heslop (2011) and Fox (2014), as previously highlighted.

Changes in the law have also helped to facilitate renewed investigations of unsolved cases; especially changes to the law on double jeopardy following the 2003 Criminal Justice Act. Previously, once a suspect had been acquitted of a crime, they could not be prosecuted again for that crime. Now, if there is 'new and compelling' evidence available that was not available at the time of the original trial a suspect can be prosecuted again and there have been a number of convictions of offenders who had previously been acquitted of the crime.

Where changes in the law can be particularly problematic is when looking at long-term unsolved cases progressing to trial. In a cold case, the law that applied at the time the murder took place applies when the case goes to trial, which becomes pertinent when we consider the changes to the rules of disclosure, as will be illustrated here with a murder from the 1980s, which subsequently went to trial in 2017. As a retired Senior Investigating Officer explained, because the crime had been committed in the 1980s and reviewed several times in the intervening years between then and the suspect being identified, as trial approached different rules of disclosure applied to the various investigations and reviews. The common law rules of disclosure applied to the original 1980s investigation and the disclosure rules

introduced in the CPIA 1996, applied to the final investigation and intervening reviews. Moreover, under the CPIA, originally a primary and secondary disclosure regime was in place, but since the mid-2000s detectives have a continuing duty to disclose throughout the investigation. As the murder spanned all these changes different rules governed what must be disclosed for each investigation and review. Everything from the original investigation (a thorough and complex investigation at the time) followed the common law rules of disclosure and the new investigation, when the offender was finally identified and charged, and all the intervening reviews, were governed by the CPIA both the initial regime and the current one.

Despite the volume of information collected throughout the years, the decision was made to be prepared to disclose everything. In all this required a team of 12 disclosure officers to do this. In addition, all of the information amassed had to be input onto HOLMES, a task that took over a year to complete and was, in fact, still being completed as the start of the trial approached. So, while we have noted previously how HOLMES has been an invaluable tool in investigations, it can create problems. In this case it was the time taken to input the sheer volume of data from the original investigation on to it. Even in live investigations the volume of data gathered throughout an investigation can outstrip the information input on to HOLMES making it difficult to keep up with the investigation.

In thinking about detectives being able to keep up with, and adequately manage, their investigations, it is worth noting here that what became clear from the fieldwork is that cold case detectives are not constrained by the time pressures detectives are faced with in current cases. They do not have to worry about leaving cases behind while working on cold cases, nor are they under intense media pressure, or pressure from chief officers demanding quick results, or from families wanting an offender to be caught. This lack of immediacy in cold case investigations (at least until an offender is charged) frees up time to consider new and innovative ways of solving the crime. Aligned to that, the copious amounts of bureaucracy and investigative guidelines to be followed currently stifling innovation in current homicide investigations, does not hamper cold case investigators, which again permits them to think innovatively about how to progress an investigation. As a retired SIO suggested; in a cold case review when a suspect has been identified but there is little evidence connecting them to the crime, given the time that has elapsed since

the original offence the suspect, unaware they have been identified, might inadvertently reveal their guilt through the strategic use of covert operations and a well-timed media strategy, to draw out the offender.

Conclusion

It is clear that major crime investigations have improved immeasurably. Developments in science and technology allow investigators to identify suspects, link them to their crimes, prove or disprove alibis, elicit vital information from witnesses and suspects, pinpoint the movements of, and establish networks between, offenders. Increased regulation has served to professionalise the investigation of homicide. All of which have been pivotal to the success of live and cold case homicide investigations.

But while these changes are creating opportunities to successfully detect previously unsolved crimes and are a vast improvement on current homicide investigations, there are concerns that change has created problems both in current and cold cases, which could result in more unsolved cases in the future. Guidelines and legislation designed to regulate and improve efficiency are seemingly stifling innovation and curtailing the craft of investigations in current cases, echoing the findings of Innes (2003) McCartney (2006) Heslop (2011) and Fox (2014). Conversely, in cold cases we have seen that freed from these constraints, the craft of investigative work can be, and is, utilised, which suggests that there remains a place for such an approach to investigations. Developments in science and technology, which allow detectives to identify suspects, plot movements and networks between offenders, though beneficial create problems. Detectives are also faced with problems keeping up with the ever-changing demands of new technologies, the privatisation of forensic science providers and limited resources, as also found by Westera *et al* (2016). The political landscape and the impact of austerity is also increasing these challenges, as is the difficulties of recruiting and retaining detectives, adding to the ever increasing workloads of detectives (HMIC 2017). Whilst not in scope for this present paper, these findings will be explored further in future research.

Given these problems are tomorrow's cold cases emerging now? In the past cases went cold when it became hard to identify suspects and link them evidentially to the

crimes, and suspects were wrongly convicted because of improper practices. The question now is will our unsolved cases of the future be a consequence of a new kind of information overload, especially of digital information to be downloaded, processed and disclosed. We are already seeing allegations of sexual violence being thrown out because disclosure officers have failed to disclose pertinent information to the defence. It seems from our data that there might also be the risk of this happening in homicide investigations. Conversely, risk adverse detectives, drowning in bureaucracy and information overload, may be unable and unwilling to push the boundaries of investigative expertise to identify offenders. Coming full circle, the problems that are plaguing live homicide investigations may also plague future cold case investigations. Budget cuts, resourcing issues and the privatisation of forensic provisions will all affect the ability to carry out cold case reviews in the future.

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