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MSc in Forensic Medical Science

Dissertation: The legal and practical aspects of forensic, factors contributing
to wrongful conviction

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Abstract

The criminal justice system is entrusted by the public with the responsibility to pursue the wrong doings. Meanwhile, forensic scientists are the sole fact finders delegated with the important tasks. As technology improves, the relationship between crime and forensics are closer than before and thus chances of error are increased due to a larger playing field. The innocence project is part of the innocence network aimed to exonerate the innocent convicted by miscarriage of justice. DNA analyses are used to provide evidence persuasive enough to overturn sentencing. Unfortunately, biological materials are scarce in all crime scene investigations with approximately only 5-10% of criminal investigations having the material required for biological profiling. Therefore, other method forms were sought to aid exoneration. It is morally wrong to convict an innocent individual and is totally against the purpose of a criminal justice system. In countries where capital punishment is still active, some of the innocent are executed before help are given by the innocence project. During 2007-2012, approximately 3000 prisoners were executed and over 5000 were sentenced to death worldwide and this limits the chances of rescue.

The purpose of this report is to gather information via search engines to demonstrate the causes, factors, and the outcome of wrongful convictions. The field of wrongful conviction is an existing problem but also a sensitive topic, statistical data are limited and there are no true research on wrongful conviction, and statistical data are also fragmented. Unlike other well-known sectors where numerous researches are available for critical review, the sole backbone for wrongful conviction is from the innocence project. This report uses mainly Google, Science Direct and other search engines to combine data from different government authorities, Laboratory including IPCC, NFI, NSCS, innocence project, and critically analysed factors contributing towards wrongful conviction.

The factors contributing to wrongful conviction are not limited to the one suggested within this report. Only the main contribution factors are included, the range of causes is too broad to be researched in a feasible manner. Contributing factors has been categorised into investigative causes, forensic causes and legal causes for easier interpretation. Majority of the research have suggested close correlation to wrongful conviction. Significant statistics include forensic failure, police corruption, false eyewitness testimonies, misconduct and ineffective assistance of counselling.

Introduction

In the recent decade, the progression in technology has caused multiple reformations of our justice system to accompany our new and more reliable technology. These pleasant and welcoming technologies have provided a stronger platform for fair play in court. The amount of wrongly convicted victims is undoubtedly decreasing. (1) However, this new era of technology sparked further implications, where science and justice crosses over. Wrongful conviction is an on-going issue we are unable to eliminate due to lack of ground truth. Justice is established based on our society where the minority has to follow. This led to the rise of prejudice in our system where bias and other forms of complications are also introduced. Rewinding our timeline we would discover phases of era where the use of DNA is not fully developed and have not met the standard for recognition. Prior to the introduction of DNA, witness testimonies form the main frame of an investigation but the credibility of our memory is another questionable matter. The competency of expert witnesses is also a debatable subject. Humans were born to believe their instincts and when the instinct exceeds our mental threshold we will choose to accept as true, resulting endeavour behaviour in condemning criminals. Unfortunately this has led to further complications, where misconducts behaviour arise in between law enforcements personnel. (2)

Prior to the development of DNA, scientific experiments like serology, hair sampling were deemed very scientific at the time. They were used to aid the process of crime investigation, but inefficient in identifying the perpetrator. It is often used in conjunction with other none forensic methods to aid the legal process. However, the use of blood typing techniques does not provide the quality of data required for prosecution and in most scenarios its risk are not properly disclosed by the prosecution side to ensure a fair trial. (3) The innocence project has exonerated a total of 255 people and the majority of exoneree's are rescued by pointing out inexcusable errors. The reliance on technology has worsened after the introduction of more forms of impression forensic identification involving CCTV imaging, facial identification, Gait Analysis, finger print analysis. These new techniques have broadened our list of non-probative evidence in court, but this causes a bigger margin of errors are introduced. As we are aware, identification and recognition procedurals can vary between experts. Therefore, the introduction of new opinion-based techniques has sparked another wave of problems. (4) The theory behind most human identifications remains on personal judgement, where two sets of data are compared and analysed to look for similarities. Simple rules are established to help increase its reliability, but it is still not up to the standard to prevent wrongful conviction.

The development of DNA have setup a new standard in the legal system, with over 99% accuracy and its ability to eliminate suspects very effectively, became the symbol of justice. In almost every trial, the presence of DNA profile will immediately create an environment of prejudice. Majority of Judges and jurors are unaware the possible problem present in DNA. Most of whom are externally influenced by the media, which often portrait DNA as the definite answer known as the "CSI effect". (5)

Wrongful conviction is a serious and urgent matter; the idea of coercing submission is far from our justice motto. The justice system aims to provide a fair platform where the prosecutor and defender receive equal rights. The breach of criminal law would result imprisonment. However the incarcerate of innocence is not the intention of our system; the statistical data for victims of wrongful conviction will or might never be available. Equally, the number of guilty criminals released due to lack of probative falls into the same

problems. Currently the availability of biological material within a crime scene is still very limited, leading to the use of less reliable forensic methods. (6) There are insufficient data to investigate or summarise the numbers of criminals released due to insufficient evidence but were later charged for the crime they have committed previously. Some of the victims of wrongful conviction have been imprisoned for almost 30 years prior being exonerated. Ultimately, for some that's already the best case scenario, some of the unfortunate inmates are given life imprisonment or even death penalty.

Humans, just like other species learn through adaptation. Human error is a vital process where we learn our wrong doing. However, all precautionary actions have been taken to prevent errors from happening in the legal aspect of medicine. Laws are created to defend the innocence and prosecute criminals. However the failure of forensic or the investigation team is deemed unacceptable. The purpose of this dissection is to explore the impact of human activities leading to wrongful conviction. It will address the problem with human errors in the investigative aspect, legal and forensic cause, which would result the convictions of innocent individuals. Evidence is a significant part of our judicial system. It is used by all government forces to determine the culpability of a person. It is also vital in the identification process, which saves the police force time and money and lengthens the critical window to pursuit criminal activities. However, imperfections within our justice system have caused the imprisonment of many innocent individuals and the culprit walked free from court. (7) This dissertation would shed some light onto the problems with the current forensic and the possible problems our judicial system are battling in the hope of reducing the number of human errors and promoting positive prosecution. This in turn can relieve the financial constraint on our current system and more importantly reduce the number of convicted by the wrong cause.

The convictions of innocence are morally wrong in our society. It is understood there are loophole in every justice system and concern of costs might have eradicated the chance of exonerate the innocence. The capital punishment is the ultimate form of punishment performed in some countries across the globe. Approximately 20% of the countries sitting on the world map are still performing capital punishment. Between 2007-2012, over 3000 prisoners were executed and over 5000 were sentenced to death. However, the exact figures remain unknown due to lack of data from Asian countries mainly from the communists such as China, Russia etc. It is believed some countries hide the number of executions as most were performed to punish opposition, in other words, innocence execution. (8)

Aside from execution other forms of prosecution can also impose a significant threat to the balance of our current justice systems. In 2012 there are 3000 cases of miss identifications within the UK due to errors in data recording, 3500 records on the police national computer were believed to be inaccurate. Mismatch by the system alone can trigger alarms, flagging innocent individuals and enforcing convictions never committed by that specific person. Another potential impact of inaccurate entries involve employment in sensitive sectors e.g. teacher, government post. Resulting in possible job losses and inducing costs in the process. (9)

The evidence currently presented in court is testified vigorously by both the defence and prosecutor to put their clients into a better position over the other. Therefore, the integrity of evidence will be the main subject in question. Crime scene investigators are trained professionally, aimed to maximise evidence values by using indisputable standard protocols devised by the forensic committee. On top of the introduction of

human errors, evidence is mostly always tempered before the arrival of crime scene investigators. Post activities by civilians, scavenger and weather can result in contamination and degradation of evidence. This would invalidate the evidence itself when questioned. The affected evidence will lose its true value in court and eventually dismissed by the judge. In cases where evidence is limited, the integrity of the evidence must be indisputable. Otherwise it could lead to injustice ruling and demeaning the law.

The motto for our justice systems is equal justice under law. A person is not guilty unless sufficient evidence is present, leading to a strong positive verdict. (10) The explicit goal for the law is to make it easier to prosecute the guilty. However the “easier to prosecute” aspect in law can sometime mislead the judge and jury when strong evidence is present. No matter how strong the evidence, if its legitimacy cannot be measured it is meaningless. In most scenarios this would require personal judgement from the judge to decide its validity. The validity of the evidence is always a questionable topic by both the defence and offence. It is certain in almost all wrongly convicted cases occur due to either the lack of evidence or incorrect evidence. The former is unavoidable in most circumstances unless evidence is destroyed due to human errors, but the latter is preventable. Advanced training are given to all crime scene investigators to prevent the degradation of evidence during crime scene preservation, evidence collection and storage.

The problems we are currently facing in our justice system are not solely due to human errors. Wrongful convictions are still happening across the globe due to other factors, but human error is a great contributor to wrongful conviction. The impact of evidence degradation can alter the decision of the judge. As we are aware, a single piece of evidence can be a game changer in court. Therefore when there are disturbances to evidence integrity, the prosecution process might become difficult due to the lack of definite proof to reach the beyond reasonable doubt stage. The statistical data for criminals released due to evidence destroyed are also another area where numbers are very hard to obtain. As our justice system’s motto have stated equal justice under law. (10) Once the court has given a non-guilty verdict, the dismissal of the case will become definite unless further evidence becomes available. Therefore it would be impossible to know if someone is truly non-guilty unless they are prosecuted again due to recommitment or proven guilty. (11)

As previously stated, the introduction of human errors is inevitable. Our law system is written by careful consideration, but nonetheless it is still prone to error and contain leak holes, which can be somewhat exploited. The current rate of prosecution is 95% of defendant in magistrates’ court and 87% of defendant in crown court within the UK. (12) This means 9 out of 10 defendants are found guilty in criminal offence and faced prosecution. Also, is it worth noting even though the current justice system stated everyone is equal under law, it isn’t necessarily true in most cases. Victims are often treated with more sympathy than the defendant, especially in cases involving females or children. There is a tendency for the judge to bias solely on gender and age difference. For instance in a rape case if the male refuse to provide evidential samples, the judge could consider this as a suspicious refusal. Whereas, the female does not have to provide a sample to press charges, as sympathy is often greater towards the female victims than an innocent male individual. Hence, prejudice is something we should be wary of. Although, best effort is made to prevent this, but there is no doubt human errors would occur when the number of court cases received is tremendous.

Our justice system was created from scratch, dated all the way back to the ancient times and is designed with a mind-set of equality rights unless proven guilty. (11) However, this matter is also limited by many

other factors. Technological advancement has had a big impact on our justice system. The introduction of high calibre identification methods have modernised our system and gave us the certainty to prosecute the guilt and release the innocent. (13) Sadly the certainty we believe in can be deceiving in some exceptional scenarios. Our advances in technology are yet to reach 100% accuracy, but judges and jury without medical background sometimes do not have full understanding of the techniques used and their possible flaws. This has created a situation where some techniques are considered dominant comparing to others, leading to the formation of “unaware” biased conclusion. These misconceptions have induced imbalance into our judicial system and require attention to ensure all evidence are accounted for. (5)

Nonetheless Human systems are prone to mistakes and when under pressure to perform, errors are often introduced unknowingly. The number of prosecutions put forward also has a direct impact on the rate of errors occurred. Though, it might not have a direct impact in the possibility of inducing a mistake but as the workload increases, the very unlikely may have a greater chance to become a likely. The downfall of our justice system is once the verdict has been decided, the offender will not be able to leave jail until they are exonerated, unless newer evidence becomes available or an application for appeal is put forward. We as a society also have strong beliefs in court decisions, especially when it comes from the Supreme Court where most of us would respect the decision. Thus, we do not have the statistical data to portrait on the scale of wrongly conviction and the numbers will not be available until their lawyer or the community exonerates an individual.

Currently, there are on-going projects aimed to exonerate individuals who have been imprisoned by mistakes. Within the UK the innocence project is led by Dr Micheal Naughton with the aim to research on wrongful conviction and miscarriage of justice. The purpose of the research is to improve our current criminal justice system and prevent similar errors. This project works in an independent manner, objectively investigate claims put forward by the alleged victims of wrongful conviction. (14) Similar innocence projects are also happening in USA and other countries with the aim to prevent the occurrence of injustice.

The exoneration of wrongful conviction is an intermittent task, which requires large amounts of resources from a team. Most cases exonerated often involve murder and rape, which normally results in long term imprisonment. In many scenarios, the victims of wrongful conviction would have served 30% of their sentence before they are exonerated by the innocence project and the exact number waiting to be exonerated will remain unknown until further evidence are available to prove their innocence. (13) Most cases put forward to the project can be dated 30 years back or more. This was the time when technology in the forensic field was still under development in the initial phase. Most of which were either inaccurate or does not met the standard to be presented in court. On top of old cold cases, there are also recent cases where exoneration has occurred due to misidentification by mistakes or done purposely in a criminal manner. Recent newer cases are always easier to exonerate when compared to later older cases. This is because cases dated back in 1970 did not have the required biological material for DNA analysis. Therefore, innocence project will only consider cases where materials with evidential value are available.

The idea of releasing a guilty person is unacceptable in our society. Our laws are designed to prosecute the proven guilty. This means the handling of evidence plays a big role in court questioning. Numerous methods are used in the forensic field to help identify victims and the perpetrator. The main goal is to prove the

presence of an individual or backtrack the event occurred during the crime. This can help eliminate or isolate possible suspects for further investigation. Other than the involvement of identification in the initial phase of crime scene investigation, the use of some forensic techniques can give a close to definite answer. Though, the evidence must be collected in standard protocol and handled in an unquestionable manner.

Nonetheless, mistakes created could have a devastating impact on a case. Researchers have found most of the serious crimes, are put to justice by civilians. Most of which involved the characteristic recognition of the suspect leading to a positive conviction. The information provided by civilians, passer-by, victims can give information police lacked to aid the investigation process. Conversely, characteristic recognition can occasionally mislead an investigator. (4) The down side of human recognition still contains flaws, which requires attention to prevent their impact. Under pressure, we have a higher tendency to implement mistakes in which under normal circumstances would be less likely to happen. It is plausible that distress victims can misidentify the perpetrators resulting the prosecution of an innocent individual. This is an unavoidable matter where precaution can be taken but inevitably will still occur. To combat this, we present many forms of evidence in hope to obtain a certainty close to perfect. There are increasing concerns regarding the external factors, which could have in a court case. One of the current on-going matters is the psychological effects could have on the judges and jurors from movies and nightly television. Famous TV series such as CSI have given us, the viewer, an insight into the work of a crime scene investigator and what they may come across in their line of work and the procedures involved. However, it has unwittingly left an impression on the viewers and possibly may have given them an unrealistic side of forensic. (15) The misconception of forensics might not affect the average general individual from day to day living but when it comes into court it can conceivably play a big part. The general public taking part in the jury panel could have a degree of prejudice in mind and expect more than what science can offer. One of the critical problems of human minds is the overlooking of other clues when there is already one convincing answer before us. The presentation of DNA and fingerprints are always considered as the ultimate form of identification but it is not necessarily true. The portraiture of forensics by TV media may have misled the general public and possibly the judges and jurors, resulting in a specific favoured form of evidence and overlooking the other evidence provided. (5)

In some states, lawyers are permitted to question the TV habits of jurors in regards to the verdict they give. Although, there are no statistical data to back up this idea, there are increasing concerns in this area. Death investigators and other forensic personnel will go beyond the extra "CSI mile" to meet the expectation of the jury. (16) This is an issue we are aware but unable to rectify unless there is an improvement in our judicial system. We are unable to professionally influence the jury because it would be deemed as a demeaning action. Therefore, this will become an on-going issue until a possible judicial system is reformed.

The progression of Forensic technology has opened up opportunities in the forensic-legal sector. We are only able to utilise specific techniques believed viable in the specific era. As technology advances, some older techniques are phased out due to the development of newer techniques. However, some techniques are dismissed solely due to their performance in the forensic field. The Innocence project has noted some techniques used in the prosecution process are far less reliable to meet expectations. It has been found not all methods presented in court are tested vigorously; some can still be in the development stage. (13) One of

the main concern is that forensic scientist can come across are the pressure to perform. It has been found some forensic scientists have fabricated results or have used other form of misconducts to achieve results leading to prosecution. Methods that require human identification are often less reliable and prone to errors. Bite marks comparison, facial recognition is both commonly used in court as a supplement form of evidence. There are also more problems are surfacing in the methods we use within forensic practice. (17)

In 2009, the innocence project has exonerated 225 cases of wrongful convictions, and it is found that in 116 cases, over 50%, are imprisoned by the use of invalidated techniques or improper forensic science. (18) The innocence project has targeted 3 major flaws during the exoneration. Cases exonerated consists the use of invalidated techniques, involving the use of hair and blood samples. Results presented in court were either incorrect or invalidated. It has also found some of the results from serology and hair analysis carry a higher chance of failure. (18)

Prior to the development of DNA testing, serology was the only method available to identify source of blood, semen and other body fluids where some techniques were performed without following the protocol. (19) Hence, the dismissal of the evidence when discovered by the innocence project team leading to exoneration. Another major concern of the innocence project is the portraiture of evidence in court. Some evidence presented in court consists of incorrect numerical statistics, giving a false probability or frequency. It has also been found some of the evidence without statistical back up is presented as a unique form of non-probative evidence, signifying an inculpatory correlation without empirical data to support such testimonies. (19) It is also surprising to see part of the exoneration involved gross misconduct by both the police force and forensic examiner. It is not uncommon to see fabricated non-probative evidence to intentionally inculcate the suspect. Also on top of fabrication of vital evidence, the innocence project has also found the personnel involved in the prosecution process have failed to disclose any exculpatory data, which could result in dismissal of the trial. (19) These errors have created a biased unbalanced judicial system requiring rectification to avoid further increment in victims of wrongful conviction. Some of the victims have served 26 years in jail prior to exoneration. The action of falsifying evidence could be caused by the mounting pressure in the desire to prosecute. Our current law system has made prosecution a tough job as key evidence is required to inculcate the perpetrator. Therefore, the failing of prosecution is very common within the judicial system. When in the phase of despair, the act of gross conduct can happen.

To exonerate the victims of wrongful conviction, the innocence project have focused on the use of well-established and vigorously verified DNA testings. Currently, the use of DNA is deemed the closest to perfect in forensic identification. Unfortunately, the availability of DNA material is limited in the crime investigation aspect. It is believed only 5-10% of criminal cases involving biological evidence is suitable for DNA testing. (6) The remaining is subjected to other forms of evidence. When the use of DNA was unavailable, other kinds of evidence will be submitted, including those not scientifically approved by forensic discipline.

Due to scarcity of DNA material, other forensic methods are often used in the process of exoneration. Since 1992 the innocence network has established a DNA focused exoneration projects. In other cases where DNA material were either absence or destroyed, the network are sometimes able to uncovered traces of evidence and gathered it together to provide evidence with degree of certainty, allowing the exoneration of

the victim. Hence the reason part of the innocence network still takes on cases regardless to the availability of DNA testing. (6)

One of the downfalls of non-probative evidence is the absence of scientific standard. The use of bite mark, facial recognition technique is common within the judicial system. However, the validity of the evidence is close to untestable. (20) The comparison of impression marks is based solely on expert witness where their opinions are case specific. Therefore the back up of statistical data is absence, which means the value of probability is also unavailable. These research areas are yet to be fully developed and require a long period of time to possibly meet our DNA testing standard. Yet, it is readily available and the majority of crime scenes has increased their appearance rate in court. (20) The lack of scientific standards in these methods has given the false impression of science. Cloaking the fact these methods are far from acceptable science practice. The presentation of this so-called scientific material in court can be deceiving to the jury and judges. The testimonies of the analysts are going beyond the nature of science. The use of common techniques does not give it the desired validity in court. However, judges and jury were not trained to differentiate and with the influence of other external factors and it can alter their judgmental ability. It is vital to appreciate the importance of statistical data in science. Without statistics, the non-probative evidence offered has no way to testify its distinctiveness. The chances of similarities and differences are required to evaluate the significance of the evidence. (5)

Furthermore, evidence presented in court requires further attention to the discipline of the analysts. The innocence project has noticed some of the technicality errors made are linked in many cases, some of which are in a national scale affecting neighbouring state. (21) According to the innocence project's finding some of the errors can be traced back to the same forensic analyst. This suggests same errors are being made repeatedly until it has been revealed. Serology testing was one out of the many culprits resulting in wrongful conviction. Before the availability of DNA, serology was mainly used for blood typing. However, the interpretation of the results contains a big flaw. Some analysts have failed to recognise the sample submitted can be a mixture of fluid. Especially in rape cases where there are fluid exchanges during the offence. The chances of obtaining forensic material from the sample are lowered due to the possible masking by the victims DNA. This would directly affect the forensic value of the sample and identification of the perpetrator. In other cases, the analysts have also been found providing incorrect statistics for the percentage of the population sharing the same blood type as the perpetrator. Forensic personnel can make unintentionally mistakes due to inadequate training. Most of the problems revolve around the cause of lack of training and experience. In some scientific practice, scientists have to handle a broad range of problems and for most of which they are not fully prepared for. This results in a different handling procedure and some will follow their natural instinct in procedural selection. (18)

The cause of wrongful conviction can be extended to an unbelievable level. According to the innocence network statistic, an astonishing 30% of the DNA exoneration cases occurred due to false confession. The defendant has produced incriminating statement against themselves, subsequently an outright guilty plea. This piece of information alone has directed us to the hidden flaw within our system. Instead of judgement based on internal knowledge or actual guilt, external influences are playing a bigger role. These unhealthy external influences are affecting our trust in our justice system. Nevertheless, there are some obvious

confessions judges can easily distinguish when occur within a trial. Criminals easily manipulate vulnerable Juveniles, children and some adult and the majority of them only partially understood the meaning of the trial and the consequence of imprisonment. It is believed these vulnerable targets are convinced by criminal once confessed they will be able to “go home”. These exploitations can range from simply misunderstanding of the situation to mental disability. (22)

Sufferers of mental disabilities or other causes leading to diminished capacity are ideal for exploitation in the criminal point of view, but some false confession cases are done without criminal encouragement. (23) An incapacitated individual have a higher tendency to accommodate and agree to authority figures. In combination with other factors such as exhaustion and length of interrogation, incapacitated individuals are more likely to give in and agree to confession in the belief of immediate discharge. Some of the suspect in questioned will also give in to the interrogation process and proof their innocence later.

Furthermore, the police force is not fully trained in the process of questioning and interrogating mentally capacitated suspect. It is believed by researchers the role of social science in the legal system is a must. According to facts and figures report published by False Confession.org police induced false confessions are among the leading cause of wrongful convictions. Currently, there are two doctrines designed specific to render the admissibility of a confession into evidence. Government forces are legally obligated to read Miranda warnings to an individual to procedurally safeguard suspects from establishing incriminating statement unknowingly. (23) The presence of *actus reus* are also required to incur criminal liability. According to the criminal law, only willed actions are considered breaching the law. *Mens Rea* must be established in court before an individual can be found guilty by the judge. In some scenario *actus reus* become a fiercely disputed subject in court by both the defendant and prosecutor. However, both doctrines are designed to judge the admissibility of the evidence. It cannot be relied on to distinguish false and true confession. (23)

In the eye of social scientists, false confession can be caused by voluntary false confession, compliant false confession and persuaded false confession. In a voluntary false confession, researchers and physiologists have suggested there could be numerous reasons behind a voluntary false confession. It isn't uncommon to see mentally impaired individual confessing to crimes due to the fact they are unable to distinguish facts from false evidence. Desire to protect the perpetrator are also another cause of voluntary confession. Physiologists also believed our pathological desire for notoriety can result in false confession, especially in the younger generations where the idea of imprisonment turned into something to be proud of rather than ashamed. Self-punishment is also another cause for voluntary false confession. Guilt stemming from prior transgressions is another cause for voluntary false confession. Self-punishment is seemed as redemption of previous wrong doing, which in return for comfort and sensation of relief. (23)

Unlike voluntariness confession, compliant false confession is totally opposite. To some the process of interrogation can be mentally taxing and to escape this lengthy process some would choose to confess to put an end to the interrogation. Others might choose to voluntarily confess due to the mounting of social pressure or overwhelming incriminating evidence. In the hope of lowering punishment or escape interrogation some might take the easy way out without fully understanding the possible consequence of their actions. (23) In 1989, 5 suspects from a high profile case involved the rape and murder of a female

victim were coercive to provide statement incriminating themselves and fabricated evidence to avoid interrogation. (24)

Persuaded false confession is similar to compliant false confession with the involvement of third parties. It occurs when an individual begin to doubt their memory and believed they have perform a criminal acts without actual memory of having done so. The occurrence is rare but possible, persuaded false confessors are normally mentally incapacitated or sufferer of extreme social pressure. Nonetheless, persuaded false confessions are exceedingly prejudicial and prosecution are pleased rather than worry as it is extremely incriminating. (23)

Although, as stated earlier government forces are able to distinguish exploited individuals, unfortunately portions of it have gone unnoticed. The lack of ground truth in our justice system means truth or false is determined by court judges and court judge's decisions are absolute unless later overturned. This alone have a generated a problem in our justice system. Baring the thought of criminal are able to manipulate others to confess to avoid criminal liability.

Police conducts have also raised concerns in false confession. It is believed part of the police force employ tactics to break that suspect's resistant to admitting guilt. Some Police are found to have fabricated non-existent incriminating evidence suggesting innocence is not an option meanwhile persuading the admittance of guilt in return for a lesser punishment. Some confessors will be intimidated to the point past exhaustion where believes of confession are the only way out. (25) Some police officers will act far beyond acceptable with actions no differ to criminals. When police officers are strongly convinced of suspect's guilt they will threaten the suspect of a death penalty in serious crime. Other will mislead the suspect into confession by using series of questions to shape the suspect's statement to provide details to the confession. Interrogator will purposely ask the motive, explanation, and other incriminating question under the exhaustion of the suspect. (25)

The misconduct of government forces do not stop at the police force alone. In the past misconduct have occurred in both forensic and non-forensic divisions, some even extend beyond prosecution. This matter can be directly related to our human endeavour nature. The process of achieving prosecution is treated as the duty of justice. However bias is often introduced motivating misconduct in the belief the suspect is guilty. Misconduct has been found in every stage of crime investigation, which consists of coercing false confession, lying or intentionally misleading jurors. There are also the submissions of questionable evidence from unreliable sources.

Furthermore, the withholding of exculpatory information have also occurred in the desperate belief the suspects are guilty. The misconduct of government personnel extend to the forensic investigator involve the fabrication of incriminating evidence. Also in the meantime the prosecution have been found with dishonest selection of expert witnesses and intentionally selecting inculpatory statement, leaving other possibilities. (25) This worsens the matter as expert witnesses are often opinionated facts rather than the truth. Therefore, it is common for expert witness from the same scientific background deriving different conclusion on the same matter. Some police force has been found going through lists of expert and specific include inculpatory statement in the hope of prosecution. (25)

The role of attorney is the main defence of the defendant, ineffective and incompetent attorney are almost a guarantee loss. In this capitalist society our justice system seems to favour the rich in many aspects. There are no exceptions when it comes to lawyering. The public funding for many public sectors are diminishing and there are no exception for our justice system. The resource allocated for court appointed counsel is also shrinking resulting larger workloads and less specialised. In reality, the ability of the attorney can fluctuate from person to person. Their effectiveness and competency cannot be guaranteed. For the majority of serious crimes defendant, expensive renowned private criminal defence attorneys are out of reach. Poorly funded defendants are left with court appointed attorney, whose ability can be in doubt. The shrinking in funding for attorney often put them through a larger work load and due to lack of diverse staff. Some will get appointed to area where they have almost no experience in. (26) This becomes an extremely serious concern when inexperienced attorneys get appointed to cases where a death penalty is possible. According to the Innocence Project New Orleans, bad lawyering has contributed to 77% of their exoneration cases from Louisiana and Mississippi.

The innocence project has revealed the scale of incompetency is far worse than anticipated. Generally Court appointed attorneys all suffer the fate of being burdened with work due to financial shortage. On top of that the lack of funding has reduced of speciality of the attorney. These factors alone have put the defendant at a disadvantage compared to others who can afford private renowned and specialised attorney. (26) The lack of experience of some attorney has already dictated the faith for some victims of wrongful conviction. The impact of inexperience attorney can contribute partly or even fully in the final outcome of a trial. In the past it has been found attorney failed to investigate alibi, consult experts on forensic issues or ultimately showing up to hearing. Some attorneys have also been found sleeping in the court room during a trial, resulting in trials where the defendant did not receive equal amount of fairness as addressed by our justice system. Further investigation has also revealed, a portion of the attorneys are shortly dismissed following cases involved death penalty. (26) The ability of the attorney would immediately become a questionable subject. However in most scenarios, our justice system has no obligation to review previous cases involved that specific incompetent attorney. In the end, the responsibility for exoneration rest upon the shoulder of the innocence project network. (26)

The scarcities of DNA material in most cold cases do not limit the innocence project. It is a long term uphill struggle for the project. Currently, there are only 5 inmates who have been successfully exonerated in the absence of any biological material since 1992. (6) The nature of our justice system has worsened this problem further. Once a sentence has been given by the judge, procedure occurred prior or subsequently will have different impact. During the trial, the court judge requires sufficient evidence and beyond reasonable doubt to hand out a guilty verdict. However any reasonable doubts raised in the future are treated in a different manner. To overturn a conviction, strong positive evidence are require for exoneration. In some typical scenarios, the confession of another individual might not be enough. (6)

The network of innocence projects is growing and most of which are receiving financial support from the government. The work of expert witness does not come cheap and most of which have consumed large amount of resources within the projects. Most of the inmates do not have the finance for exoneration only minority will rely on family and friends. The rest will have to go through the innocence project. However,

funding allocation by the government has specified a 3-1 ratio for DNA to non-DNA cases. Meaning, cases that offers zero DNA material are generally rejected due to insufficient funding. This portion of the inmate is known as the forgotten population.

Method

The area in question is a relatively unpopular subject and sources are not readily available. Therefore to explore the factors contributing to wrongful conviction, this report employed search engines including Google, Science Direct etc. to obtain statistical data, evidence and other forms of report material to summarise the extent of wrongful conviction and its cause. Journals, E-book, Online news report, articles were acquired via search engine and its information and statistics were written into an understandable manner. The context were critically analysed to combine a full picture of wrongful conviction.

The Innocence project also formed the back bone of this research, exoneration lists, case studies and many other forms of wrongful conviction statistics, facts were gathered by the Innocence Projects situated in the US, UK, New Orleans to demonstrate the effect of wrongful conviction.

Discussion

Wrongful conviction or for some, the miscarriage of justice are a known problem within our society but scientists and lawyers are still unable to produce preventative measures to stop further victims of wrongful conviction. The cause of wrongful conviction can be categorised into investigate cause, forensic cause and legal cause, but the origins of wrongful convictions can extend far beyond these 3 causes.

Unfortunately there are insufficient statistical data available online to illustrate the full picture of wrongful conviction. Therefore the majority of data mainly derives from the innocence project and other third parties to demonstrate different factors contributing to wrongful conviction. It seems the government does not store data related to wrongful conviction in fear of reputation damage, but they did suggest a compensation scheme for the wrongly convicted. (27)

It is believed the scale of wrongful conviction is greater than anticipated and majority never had the chance to come to light. Every legal justice system contains procedure for overturning sentences and appeal for freedom. However, in most scenarios the accessibility of this material and help are unreachable. Inmates have to rely on third parties making self-exoneration impossible. Without the help of family and friends the next option available are the tightly budgeted innocence project. Some parts of the innocence project network received money from local governments as a source of income to maintain the project financially. (28) The allocation of funds can vary between the natures of the work involved. Governments and the innocence project are aware the viability of DNA analysis. Approximately 3 times as much finance are allocated specifically for DNA exoneration purposes. On top of government financial input, the innocence project also receive financial support from various sectors, 45% of their funding came from individual, 30% from foundation, 15% from annual benefits dinner and 7% Gardozo school of Law and the remaining came from other sources. (28)

The revolution of science has unlocked the door to exoneration. DNA is a major leap in science where the wrongly convicted would have a stronger ground to appeal. The wrongly convicted can be exonerated by DNA analysis efficiently due to its high accuracy nature in our current technology. Other forms of exoneration are also possible but is no match to the efficacy of DNA analysis. (29) Back in the 19th century, science can merely cope with the demand of our justice system. In today's standard the data produced and submitted to court in the 1960 would be insufficient for prosecution. The early use of genetic markers can extract so little information, where identifying specific individuals were deemed impossible. Prior to the development of DNA, bodily fluid analysis and other forms of impression comparison were considered as non-probative evidence. The analysis of bodily fluid including blood uses the Latte test, the absorption elution test and the absorption inhibition test. (30)

Some of these methods were originally developed in the early 1900s but were phased out when newer techniques were developed and became backup or confirmatory methods. Dr Leone Lattes initially developed the Latte test in 1916 and is the very first method developed for use with dried blood in the forensic field. It is aimed to provide simple ABO detection for use in the elimination process or simple suspect matching to proceed for further investigation. However as detection technology advances, the ABO no longer provides sufficient evidence for continual usage. The development of new techniques enables the detection of antigen, which has taken over the place of Latte test. (30) Similar chains of event have also occurred to other methods solely due to the raising standard of our probative evidence, resulting to the phase-out of less specific identification techniques. These techniques are only capable of detecting ABO blood group substances and ABO isoantibodies. In theory it should have helped by narrowing down the suspects by using a combination of all 3 tests. However, it has a typically high chance of failing due to deterioration of genetic markers or in some scenario yielding erroneous results. (30) Baring in mind, the results that deemed unviable today are being presented in court and used as identification evidence. The rate of errors introduced could be far greater compare to today standard. This created a controversy, even in today technological standards, we are aware of the down falls of forensic. All techniques contain a degree of error and there are known problems in many forms of forensic evidence with impression comparison being in particular. In theory, techniques which have been phased-out are not as effective as techniques currently used. If we put that into consideration, the majority of cases were decided based upon those evidence. This would raise concerns immediately toward this wrongful conviction matter.

Wrongful conviction can be seen as an intolerable matter when serious crimes are involved. With technology back in the 19th century, it reasonable to doubt the number of victims fallen into wrongful conviction are higher due to less reliable forensic. Serious crimes like murder often results in death penalty in certain countries. The abandon of capital punishments only occurred after the 1976. This would raise questions directly aimed to those who have been executed. Considering the development of our forensic methodology, in the 19th century we could have easily executed the innocence without even realising it. This is because the fabrication of evidence and introduction of errors were incredibly easy. (32)

Unfortunately, the majority of data in relation to wrongful conviction are not available for comparison. It seems the government did not publish any statistical data for any wrongful conviction to protect the justice legal system. Most of the statistics are acquired from other public sources, including the innocence project

network and other non-government sources. It is believed 2000 inmates were saved since the start of the innocence projects worldwide in 1970. (31) 144 of the exonerees were given a death penalty in the state due to the involvement of serious crimes. The currently different methods are used for exoneration mainly consist of DNA and it is the most effective method. The development of DNA have given the innocence project a strong firm ground for appeal due to its high specificity.

The purpose of this report is to explore the problems that exist in our current justice system and investigate the effect of systematic and human errors resulting wrongful conviction. The introduction of human error is unavoidable and it is reasonable to believe there are honest mistakes made during an investigation, considering the number of processes and personnel involved. From an investigative approach as we are all aware, forensic material will deteriorate as time goes on. Missing the critical window will instantly create controversy and identifying the responsible will be immediate. From an investigative approach, the introduction of errors is a known issue and protocols are established to reduce questionable errors. However, it is not uncommon to find forensic failure and the corruption of government forces.

Wrongful Conviction: Investigative cause

Police Corruption

The corruption of police force mainly involves the fabrication of incriminating evidence, demeaning the justice system, and unswervingly leads to wrongful conviction. The Independent police complaint commission (IPCC) was established in 2004 following the Police reform Act 2002. It is specialised in handling complaints against the police and running an investigative approach to help solve existing problems in our justice system. The IPCC have published a report in 2008 including figures of police corruption allegation and the possible impact relating to wrongful conviction. The definition of police corruption to most is somewhat vague but clear. It is hard to define police corruption by simply suggesting fabricating evidence. The IPCC have conducted surveys, focus group and interviewed across England and Wales to establish the general public understanding of police corruption. Majority of the interviewees have given similar definition including the abusing of authority, alteration of evidence, bribery and anything from cover up to ignoring specific cases. The abusing of power and bribery occur more frequently in poorer countries and numerous high profile scandals have risen. Some included were even high ranking government officials. (33)

Corruption allegation category	N	%
Corrupt practice	1,263	14
Irregularity in relation to evidence/perjury	3,758	45
Improper disclosure of information	3,521	41
Total corruption allegations	8,542	100

Figure 1 - The number of corruption allegations recorded 2008/09 to 2010/11 by the IPCC. (33)

The IPCC has flagged 1,263 cases of corrupt practice, 3,758 cases of irregularity in-between police officer, evidence and perjury, and 3,521 cases of improper disclosure of information.

It is comprehensible to suggest not all actions stated in police corruption will result in miscarriage of justice, but in some the acts of cover up and destroying of evidence could result in the escape of criminals. The correlation between bribery and miscarriage of justice is undoubtedly closely related. Actions involved dropped of charges in return for favours, lying and creating false entry in police pocketbook to peruse malicious prosecution, misleading or encouraging witness to provide false evidence leading to failed prosecution. (33)

Under the Police Reform Act 2002, all police forces are required to record all relevant information from the public complaint in regards to the conduct of police officer and staff. As shown in figure 1, during 2008 to 2009 and 2010 to 2011, 8,542 cases of police corruption allegations were received from 2700 people in a two year time frame. 14% of the alleged are believed to have taken part in police corruption seriously perverting the course of justice. Almost half of the alleged are found to have been involved in irregular activities linked to evidence and perjury. The alteration of evidence can induce serious consequences to our justice system. The destroying or fabrication of evidence would effectively tip the balance of our justice system, resulting miscarriage of justice or escape of criminal. Some have also been found providing falsified testimony under oath. Falsification is serious offence and shares the same consequence as other form of serious police corruption leading to unfair conviction altering the original intent of our justice system. Another 41% has been found to have been involved in disclosing information breaching the police conduct. The disclosure of information is strictly controlled to prevent any non-government officials obtaining sensitive information, its usages could lead to unfair actions endangering others or creating situation favouring the suspect or victims. The number of police corruption disputes received is only portion of the complaints received by the IPCC. The IPCC have dealt with over 170,000 cases of complaints toward the police force in all aspect of police activities. Using the statistical data provided by the IPCC, the average number of personnel involved in police corruption is believed to be 33 per 1000 police staff. This number would not be astonishing in other sector where errors are more tolerated. However, when it is related to the legal justice system this figure is relatively high considering every 100 court cases 3 -4 cases are trial in an unfair manner due to foul play. (33)

Means of dealing with complaint	Corrupt practice		Irregularity in relation to evidence/perjury		Improper disclosure of information		Total corruption allegations	
	N	%	N	%	N	%	N	%
Investigated	617	54	2,156	60	1,688	51	4,461	55
Local resolution	127	11	607	17	988	30	1,722	22
No further action	404	35	835	23	638	19	1,877	23
Total	1,148	100	3,598	100	3,314	100	8,060	100

Figure 2 – The handling of corruption allegations in 2008/09 to 2010/11 (33)

The IPCC have 3 means in dealing with allegations, either investigate local resolution or dismissed.

Police corruption requires investigation to acknowledge the degree of its impact and any victims of miscarriage of justice stemmed. The IPCC have conducted interviews of the alleged to investigate and inducing punishment. Interviews were conducted via long hour's phone call or in formal interview settings taking up to numerous months to shed light on any possible victims. Any irregular activities in relation to evidence or perjury are investigated with priority, to lessen its possible impact on the public. Out of the 3 categories of police corruption 60% of the cases submitted to the IPCC are investigated and resulted further actions, followed by 51% of corruption practice submitted by the public. Improper disclosure of evidence is also investigated and roughly 30% are resolved locally as shown in figure 2. Less serious allegations are often dealt with via verbal explanations or information by police supervisors to clear up any misunderstanding. In some situation senior officials would be required to provide an official apology on half of the police force and suggests future plans to address the problem including prevention. Local resolution occurs if the complainant withdraws an allegation or due to insufficient evidence or other reasons including oppression and vexation. (33)

Moreover, 35% of the cases submitted under the corrupt practice categories are dismissed and no further actions were taken. Similar resolution also occurred to Irregular activities in relation to evidence and perjury and improper disclosure of information, 23% and 19% respectively. All 3 kinds of police corruption shared the same characteristics of criminal injustice. However more cases were dropped in relation to police corruption due insufficient evidence, which is required to launch a full investigation and substantiated evidence is required to press charges. Unlike the other two categories, the IPCC's responsibility of corrupt practice cannot be waived by a formal apology or simple explanation. Therefore, evidence fraud and corrupt practice are less likely to be solved via local resolution, as the nature of the offense is more serious. (33)

Further course of action will always be taken if laws are breached by a police officer. Over half of the allegations submitted for police corruption in-between 2008/2009 and 2010/2011 are reviewed and investigated in formal. Out of the 50% cases the figures were further broken down by IPCC's investigation. The IPCC records have shown 544 of the 4,461 cases investigated allegations are proven to be police misconducts, statistically equivalent to 12%. (33) Inspecting policing in the public interest (HMIC) has also published a report in 2011 giving similar figures. A total of 554 allegations were investigated in association with police corruption and 12% of those investigated were found substantiated in a 3 years period. (34)

Other than public allegations, the police force also has a system in place to refer corruption practice internally. Most of the cases referred internally are dealt with internally, but with cases linger onto public concern the active involvement of IPCC become necessary. The defying nature of some cases would require independent research which applies to 30% of cases where there are beliefs public concerns are involved. Combining figures of public allegations and internal referral a total submission of 5298 were filed. These cases were investigated either independently, supervised or delegated to local police force to explore the magnitude of police corruptions. (33)

In May 2010, the Association of Chief Police Officers (APCO) has published a report addressing key findings regarding police corruption within the UK. Data from UKBA, HRMC, SOCA and Police analysis database were collected by APCO Counter Corruption Advisory Group to classify all reported cases of corruption into 5 categories. A third of the alleged are found have been involved in malicious activities perverting the course

of justice including falsifying records and eye witness statement, tampering with evidence and perjury at trials. A similar portion of the alleged has conducted theft and fraud, comprising confiscation of seized items involving money and illicit drugs. Fraudulent expense or theft of several thousand pounds was discovered. 15% has been found abusing authority and trust and misusing police power for personal gain ranging from bribery to engaging sexual intercourse. 13% has been found disclosing crime report information and personal information of civilian, offenders and suspects jeopardising the integrity of a court case. Last of all, 9% of the allegations involve the misuse of police database and other systems for personal gains. Some of these searches are performed for family and friends, threatening our privacy and other vulnerable parties. 4 out of the 5 categories can be correlated to wrongful conviction, which means 70% of the alleged police officers have been involved in malicious activities perverting the course of justice and inducing wrongful convictions. (33)

Table 1 – Investigation outcome by the CPS, 2008/09 to 2010/11 (33)

Investigation Status	No. of allegation
Released by the CPS	33
Prosecuted by the CPS	13
Awaiting decision	5
Acquitted by the CPS	5

After the lengthy referral process of all alleged officers, if there are indication of criminal activities, referral to the crown prosecution service may become necessary. Sufficient evidence must be available and there must be beliefs it would leading to a conviction. According to table 1 published by the IPCC, approximately 45% of the cases referred to the IPCC under the police corruption category have been forwarded to the CPS for possible criminal punishment. Following trial, 13 officers were found guilty and 5 were acquitted. The remaining 33 members of police personnel were released according to the decision made by the CPS. 10 of the convicted were given prison sentence. 1 was given a suspended sentence and another was fined. The remaining officer was convicted numerous charges and awaiting further trial to decide sentencing. The convicted are found to have been involved in allegations including sexual assault, fraud, perverting the course of justice, falsify statement and misuse of government system. The convicted police officers have a ranking range from constable to commander. (11)

The IPCC have noted there is a 15% increase in police complaints, meaning there are an increment in the number of officers possibly being involved in police corruption. However the IPCC did not provide further detail in regards to the number of victims resulted from police corruption and figures provided by the IPCC do not give full coverage of police corruption, the hidden and uncovered crimes are possibility buried in snow and in recent actions the Met Police have destroyed large number of files in relation to police corruption, which means for a lot of victims hoping of shedding some light would meet a dead-end.

The Problem with eye witness identification and testimonies

Unfortunately police corruptions do not illuminate the whole picture of wrongful conviction. Many other influences exist and almost all victims are affected by multiple factors during a trial. The daunting impact of eyewitness statement can condemn criminal but also the innocent. From forensic point of view, memories can easily be confused, altered under the right circumstances. Eyewitness testimonies are often an important source of evidence, capitalised in court by the prosecution or defence. (36) However, there are numerous problems in this method the innocence project have published report in regards the eyewitness misidentification and approximately 75% of the exoneree's conviction involved false eyewitness statement. (35) During a crime there are numerous variables which can affect the recall of the perpetrator. External factors like lighting, angle, and clothing can alter the perception of the victims, resulting poor encoding and affect the image captured. Memory also contributes to misidentification. We sometime capture low resolution imagery and which lead to image reconstruction within the brain by external influences mainly the police and media. Our visual memory are also affected by distortion resulting small sizes grow, large sizes shrink. (37)

The first 130 exonerees rescued by the innocence project within the USA have demonstrated the revolting nature of eyewitness identification. It has been found by social scientists eyewitness testimonies are similar to scientific evidence and subject to contaminations. (36) In the beginning, standardised protocols are developed to help reduce the introduction of errors and preventing debatable results. The protocol devised additional attentions are required in the documentation phase of the identification procedure, all photos should be preserved in a photo array for future reference and recording should be made available of all personnel present in the line-up. Paper work should be carried out professionally and if eyewitness identification were made, witness's degree of confidence should be record in witness's own words prior to receiving feedback from the authority. Any feedback which can distort the witness confident level should be avoided until the end of the trial. It has also been suggested the personnel involved in the identification process should not have any information or knowledge which can relate to the suspect during the line-up to prevent the introduction of preconception. This can prevent officials purposely or unknowingly giving clues to the witness. The sequence of presentation also require careful consideration to avoid possible "comparison shopping". Line-up member should be presented sequentially to the witness to encourage judgement based on memory as oppose to making relative judgement. To provide further aid to the eyewitness identification process, the eyewitnesses are instructed that the suspect may not be present and eyewitness should not feel compel to make identification. Effort is made to minimise chances of relative judgement by relieving the tension and pressure. The selective of fillers always require careful consideration. All fillers must matches the suspect description and avoid any actions that can direct attention to a specific line-up member. (36)

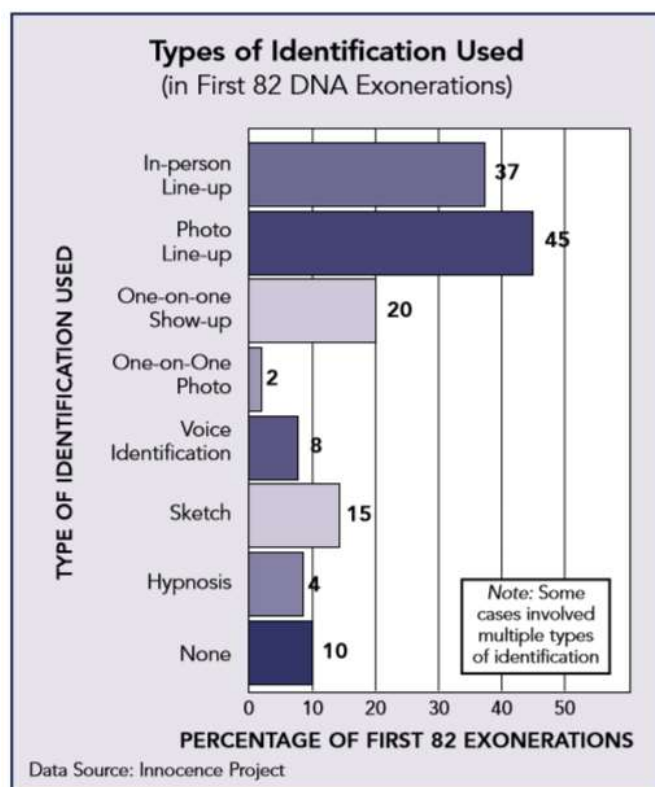


Figure 3 - Types of identification used (36)

These are the type of method used by the police to obtain eyewitness testimonies.

The innocence project has noticed some of the eyewitness testimonies have been twisted to give unfair disadvantage to the suspect. On top of the figure established by innocence project, a wrongful conviction centre established within North-western University School of Law has studied 86 cases of death sentence exoneration and noticed 38% of the cases tried contain only eyewitness testimony. (36) Eyewitness testimony has also been found to have been involved in wrongful conviction of over half of the exonerees. Further investigation has shown 7 different type of identification materials have been used in these cases. As suggested the introduction of relative judgement are unacceptable in the eye of justice. Shown in figure 3, 82 of the cases tried involved the use of in-person or photo line-up and as suggested above, this would introduced "comparison shop", which is directly perverting the course of justice. Only 22 received the ideal one to one session with the line-up members. Shockingly, 27 of cases received unconventional techniques with possibility zero evidential value. The use of sketch, hypnosis and voice recognition are far from forensic ideal and they do not meet the standard to be presented as incriminating evidence. (36)

The standardisation of eyewitness identification provides stronger backbone to evidence collected and raised its significance. Numerous of researches have been conducted in a vigorously manner to explore any hidden vulnerability of eyewitness testimonies. (38) Since it is a popular form of evidence extensive research are required to assess its integrity. Steven E. Clark from the psychology department in University of California has researched on external factors that can affect the outcome of an identification process. He specifically targeted his research against administrators of the identification parole. (38) As we are aware,

external influence contributes and elevates the rate of misidentification and scientists as early as 1904 have suggested in conjunction with others, mutually agreeing police should not assist or influence witnesses. (36) Currently the police force are not strictly controlled by this guidelines meaning there are still on-going cases where police are steering witness toward the suspect and these actions are likely to be going under the radar as it cannot be challenged by law unless there are breach of police conduct.

	No influence		Influence	
	Guilty % (n)	Innocent % (n)	Guilty % (n)	Innocent % (n)
Suspect	36.1 (13)	13.9 (5)	77.8 (28)	36.1 (13)
Foil	36.1 (13)	25.0 (9)	11.1 (4)	30.6 (11)
No ID	27.8 (10)	61.1 (22)	11.1 (4)	33.3 (12)

Note. Each column presents the percentage (%) and frequency (n) of each response.

Figure 4 – Identification responses for influence and no-influence conditions (38)

To demonstrate this on-going problem, Steven Clark and his team have specifically researched the effect of external influences. 144 participants were selected from the University of California with approximately half of the participants being equally male and female. The participants were shown bank robbery footage and their task is to identify the suspect. Prior to the identification process, they were asked to rate their confidence level in identifying the suspect and later an unbiased instruction was read to the participants and the line-up members were selected according to the perpetrator description. This research has yielded interesting results demonstrating the effect of administrator's influences. (38) Without any administrators influence, the chance of selecting the suspect and filler are equalled in a guilty matchup (figure 4) Nonetheless, 28% of participants failed to point out the suspect. In an innocent matchup, approximately 40% have made a selection and 14% are certain the suspect is present, but 61% did not make identification. For the next part of the test, administrators influence was introduced. 78% have managed to point out the suspect correctly in a guilty-suspect line-up. Only 11% have selected the filler and another 11% have not made identification. In an innocence-suspect line-up, almost triple the amount of participants has identified the suspect effectively lowering the number of no ID. There is also a slight increase in the number of selection of the fillers but the increment is insignificant. The results have shown that influence from police officials would double or triple the rate of misidentification. (38) Ignoring the fact the line-up was truly guilty or innocent; the input from police had significantly increased the rate of identification by inducing external influence. This effectively induces unfair elements into our justice system.

Due to the nature of witness statements and its vulnerabilities, Researchers have also investigated on the type of information more appealing to eyewitnesses. Farhan Sarwar *et al.* have conducted a research by showing footage designed to explore eyewitness memory under different conditions. He has noted our

memory were most efficient when the actions were remembered. Non-forensic related information and similar trends are shown across 4 different testing conditions. Under lab testing conditions, participants are able to remember 87% of actions taken in the footage and similar readings were also obtained in other settings. Candidates also performed extremely well when questioned in regard to non-forensic material. This suggests, when not pressured our memory performs better, similar to action activities such as walking and running. However, when it comes to detailed information, the performance of candidates between all settings struggled and dropped dramatically. Candidates are only able to recall averaging 50% of the subject questioned. (39)

Considering the submission rate of eyewitness statement, we would normally assume the accuracy should be relatively high. But there are mounting evidence against the reliability of eyewitness statement. This type of evidence should be treated as supplement evidence similar to other less reliable evidence. Suggestion of Standardised testing method used in facial identification has also appeared across the forensic-psychology department. Weshcler Face test were suggested to be used within eyewitness identifications practice to help create uniform answers, and to avoid any unnecessary external influence. (40)

False Confession

Although it has been explicitly stated the use of force to induce confession are unacceptable and there are no guidelines to prevent coerced confession. There is evidence indicating police interrogations are still being used under the radar similar to police corruption, inducing wrongful conviction. (34) Researchers have narrowed down the key contributing factors involved and noticed there are similar characteristics between the cases, ranging from custodial and interrogative pressure, psychological vulnerabilities or both. (22)

In a study exploring the cause of false confession, 11,388 students were selected in Iceland from 40 different educational institutes. 20% of the participant has suggested they have been interrogated at some point within a police station. 12% of those interrogated have admitted they have given a false confession to get a lighter sentence or end the interrogation. According to the statistical data, males experience increased chances of being interrogated and the percentage for false confession is also higher among males. (22)

The reason behind false confessions can vary widely. The majority of participants giving false confessions tend to be covering up another person. 17% have stated pressure from the police have caused them to falsely confess. Another 12% are experiencing threats from third parties and an equal amount of participants confessed simply wanting to get out of custody. The research has also yielded astonishing results. 31% of those who falsely confessed have been convicted by the CPS. In the public view, justice system should be fair and no innocent should be convicted. However, data suggested our justice system to be still far from fault-prone. (22)

Furthermore, there is strong statistical data suggesting the effect of psychological vulnerability can contribute to false confession, eventually resulting wrongful conviction. To demonstrate this specific problem Farhan Sarwar *et al.* (39) compared participants with and without Attention deficit hyperactivity (ADHD) in relation to false confession. ADHD is a mental health disorder leading to impulsive activity in seeking attentions. The researchers have found ADHD sufferers are twice as likely to falsely confess

comparing to non ADHD sufferer. Moreover, other emotional stressors from family and friend or being a bully, victims are 3 times as likely to submit false confession. (22)

There are no definite causes for wrongful conviction and it often involves multifaceted factors. There are numerous victims of wrongful conviction and it is increasing yearly. Bruce Godschalk has fallen victim of wrongful conviction and was jailed for almost 15 years in May 1987. He was convicted of two counts of rape and two counts of burglary in Montgomery court. The conviction was made based primarily on the eyewitness identification provided by the victims and a false confession induced by police interrogation. It is clear there were problems in the eyewitness testimonies and the police handling as DNA later exonerated him. The semen obtain from the victim did not match Bruce Godschalk and the innocence project also argued on the ground of police misconduct. (41)

Wrongful Conviction: Forensic Cause

The CSI Effect and its impact

Due to the scale of our legal justice system, it is not uncommon to have errors involved. The investigative approach of our judicial system is already facing numerous problems ranging from police corruption to mental vulnerability. Furthermore, the media have also contributed to the downfall of our justice system. The CSI effect refers to the impact of media on the criminal justice process, typically television shows like Crime Scene investigation. There are statistical research suggesting jurors of even inexperience judges can be affected by the CSI effect, resulting high forensic expectation and other disbeliefs. (15) Numerous researches has been concentrated on the jurors and the majority have concluded, jurors who were frequently exposed to forensic programmes have high expectations in the availability of forensic evidence, and in the event of lacking forensic evidence most jurors will acquit guilty defendants. (15)

The existence of CSI effect is undeniable and there are several academic attempts made to address this CSI effect. Previous effort in addressing the problem is mainly conceptual or theoretical. The lacking of systemic empirical research means there is no opposing ground. Later, surveys were given to jurors or mocking-jury experiments among college students to get an empirical approach. (5) Although, there are some empirical surveys, it isn't enough to examine the true existence of CSI effect on jurors. To fully establish the impact of the CSI effect, Kim and his colleague selected 1027 jurors from the Washtenaw county court. They were randomly selected and to erase genders error, approximately each half of the population was equally male or female. The purpose of this experiment is to examine the willingness of each juror to convict the defendants when there were only circumstantial evidence and eyewitness testimonies. The jurors will be instructed to consider both types of evidence and make a verdict base on them. Circumstantial evidence and eyewitness testimonies are not the best form of evidence and require careful consideration from the jurors and hence this would pin point the effect of CSI drama. (5)

Results obtained via multivariate analyses have shown no direct significance between juror performances and CSI drama and it is dependent on the juror being questioned. However, the juror's response in situations involving circumstantial evidence does vary accordingly to the evidence itself and other variables. The backgrounds of the jurors seem to have an influence on their verdict in conjunction with the CSI effect. Age, gender, race, educational background was significantly associated with their willingness to convict defendants. Jurors have a higher expectation about forensic evidence to be presented by the prosecutor. Without evidence, the jurors are more reluctant to convict defendant. (5) This report did suggest the probative value of circumstantial evidence remained, but on the other hand the researches implied the impact of circumstantial evidence are no longer fairly considered due to the CSI effect. (5)

The full picture of the CSI effect currently remain unknown, there are numerous research targeting its impact on enforcement official. Most data derived were controversial, and no strong background links can be found nor can it be excluded. In a study carried out by Dr Robert, the media twists 62% of defence attorneys and 69% of judges agreed juror's expectation in forensic evidence. Hence the introduction of "negative evidence" witness by the prosecutors to explain the real expectation of forensic prior to trial.

Although the CSI effect might not be directly related to wrongful convictions, it is part of a jigsaw contributing to miscarriage of justice. (15)

Forensic Fraud and Misconduct

The conduct of forensic scientists directly correlates to the safety of the public, but currently there are no single ethical code bounds to all disciplines of forensic. (42) Within the United States there are two organisations monitoring and have developed ethical codes relating to forensic testimonies and the presentation of forensic analysis in court. American Board of Criminalistics (ABC) and America Academy of Forensic Science (AAFS) are two of the primary professional bodies monitoring the practice of forensic. The ABC extensively stated on their ethical code, all certified members must only provide testimonies to the extent justified by evidence in question, in a straightforward manner and not misleading or beyond their field of competence. (42) In addition to the ABC ethical code, the AAFS have established guidelines for members and analysis. These guidelines suggested that forensic scientists and attorneys are working towards a different purpose; forensic scientists are physical facts finders. Therefore, every effort should be made to uphold the oath and reasonable effort should be made to avoid distort judges, jurors and sometime the attorney. (42)

Defective or Fraudulent Science (first 74 cases)

Scientific fraud by type. Many cases featured a combination of these types of fraud.

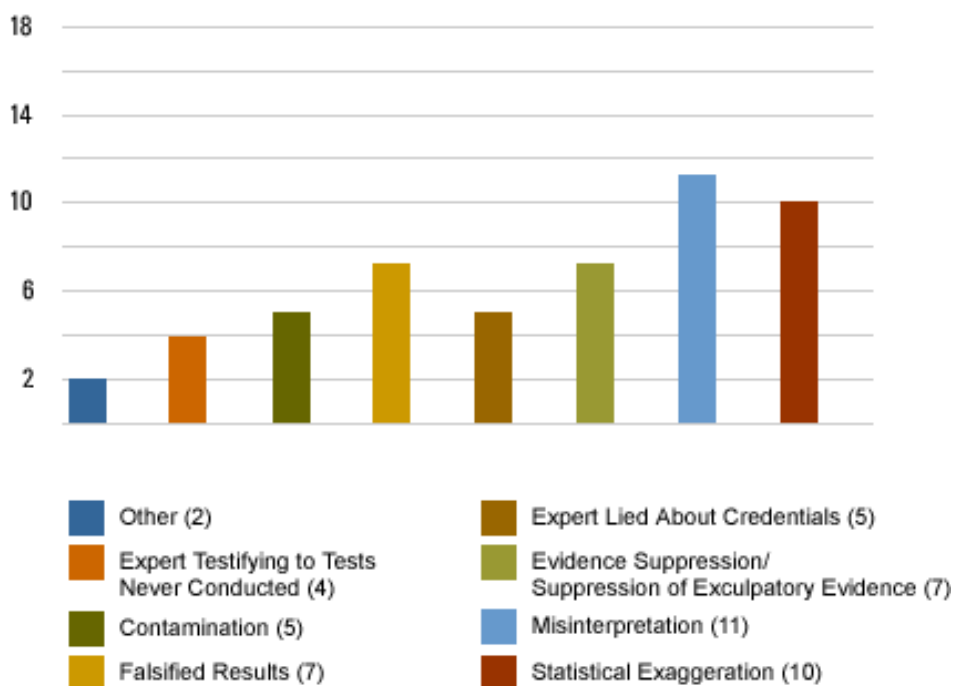


Figure 5 - Defective or Fraudulent Science (First 74 cases) (19)

Statistical data associated with forensic fraud and errors are still very limited, possibility due to fear of reputation damage. Most forensic laboratories are unwillingly to give detailed statistics on errors made. Throughout, search engines and journal libraries statistical data for fraud and error in forensic science are

very scarce. Only statistical data are provided by innocence project to demonstrate the realistic extent of forensic failure. From the first 74 cases of exoneration, only 2 had a non-forensic related cause (figure 5). This alone should have already demonstrated the close relationship in-between legal and forensic. (19) The primary objective for criminalistics is to find physical facts, which maybe significant in legal process and judges are to determine if someone is guilty based on facts. Therefore, fraud in forensic can fully dictate the outcome of a court case.

Forensic failure: Contamination and misinterpretation

Forensic evidence is the most important part of a legal justice system. It can provide answers to many questions raised throughout the investigation process. Unlike investigative causes, forensic evidence is the heart of our science justice systems. Forensic misconduct and wrongful conviction share a very close link. The fabrication of results or any form of errors in the forensic department will jeopardise the whole judicial process. The innocence project has stated almost half of the exoneree's rescued were convicted based on improper forensic data. (18) Similar statistics can also be found on other reports. Even though, forensic science is a highly anticipated subject, science experts agreed it is less reliable than assumed. This applies to less well known forensic disciplines including hair, bite mark analysis and arson investigation. Even, the highly trusted fingerprints and DNA are not perfect. Systematic errors may not be as prominent, but on the other hand other errors are introduced during the analysis phase of results.

Table 2 – Forensic science error rates by area (17)

This table demonstrates the error rates for different forensic areas. Bite marks and voice identification have over 60% rate of errors, whilst fingerprints analysis share very similar error rates to DNA analysis.

Modality	Error Rates
Bite marks	64%
Voice Identification	63%
Handwriting	40%
Hair	35%
Fingerprints (by person)	4% to 7%
Fingerprints (by sample)	0.6%

Contamination is a common problem faced by scientists in situ or outdoor. Systematic contaminants are introduced mainly by the environment in a natural process. Other than the natural processes, investigators or other crime scene personnel's cause the majority of contamination. Planning ahead is always required and the establishment of standard protocol is a must to ensure evidence maintain its integrity throughout the judicial process. In the first 74 exonerations by the innocence project, 5 cases of wrongful conviction were resulted from evidence contaminations. Faulty serology and hair samples were commonly uncovered by the innocence project. (18) Currently, the area most likely to contain flaws is Bite marks comparison with an error rate of 64%, closely followed by voice recognition of 63%. Handwriting recognition also has an error rate of 40%. Impression Comparisons technique contain high range of error due to its opinionated nature. Forensic evidence theoretically should have a smaller margin of errors, but a portion of the samples and

methods we used are still far from ideal. The hair samples we are still currently using have an error rate of 35%. Finger print analysis also has an error rate in between 4-7% and our renowned DNA profiling have an error rate of 0.2-1.2%. To investigate the errors currently experience in science, DNA are used as the subject of forensic errors as its data are recently (17)

As explained, the earlier rate of errors is very common in scientists as there are many factors determining the rate of errors and most of which are uncontrollable. We have established protocols to prevent any human errors, but systematic errors are often impossible fully eliminate. Contaminations often play part of reasons why experiments fail. Errors in forensic science and medical science can have a far reaching consequence in many affected sectors. In terms of conviction, the innocent can be jailed, where the guilty suspects could be exonerated. Miscarriage of justice can carry a hefty consequence as it will generate media attention and leading to distrust of our justice system. (29) The Netherland Forensic institute (NFI) have suffered from such event known as Avenger of Zuuk. Traces of Female DNA were discovered on a postal item from a series of arson and anonymous threats. The Dutch rural community Zuuk had conducted mass screening but eventual the incriminating DNA profile was discovered to have come from laboratory contamination and matched a NFI technician. (29) However this was a lucky case, similar errors have been made by mixing crime sample with other DNA samples resulting in a false match. The error was noticed at a very late stage in the legal process. Gross contaminations in these cases are uncommon in laboratory, as standard protocol and other preventative measures are in place. Background contamination could occur more frequently, causing drop-in alleles in the final results. Routine DNA result evaluations are required to help identify these errors. (29)

Throughout, the analysis of DNA has become an important part of crime investigation. It is the gold standard of forensic science and mistakes are made but never fully published at a detailed level. Currently, only general statistics are available including contaminations rates, laboratory failure rates and other common errors. The reason for such lacked detailed statistical figures on DNA error rates is due to fear of reputation damage. The lack of transparency have raised some questionable matters mainly involve the trust from the public and criminal justice system.

In the past 15 years, the error rate for DNA remains relatively constant. Statistical data suggests a slight improvement in DNA analysis. Medical laboratory have a failure rate of 0.3% giving a total of 160 cases in 2007. The impact of incorrect forensic evidence can lead to serious consequences in the justice legal system. Data from the Human Biological Traces Department and Netherlands Forensic Institute were combined by a research to demonstrate the DNA failure process from origin to the end results. (29) According to the NFI there are 54 cases of DNA contaminations occurred outside the NFI, 210 cases investigated by NFI are believed to be caused by external factors. Clerical errors with no adverse outcome have also been involved in 14.3% of the total errors. Quality issues within the forensic industry are very sensitive, as it can be linked to other errors where the data were used. The NFL facilities have over a thousand reported cases of contamination occurred within their own facilities. (29) The most common cause of quality errors are caused by contamination and human error. Contaminations were detected in all forms of samples and reagent, including crime samples, reference samples, positive controls and reagent blanks. Similar errors are also made in the analysing phase, positive and negative controls were overlooked resulting misinterpretation of

results. Other than contaminations and human errors there are also technical problems involved. Traces of DNA were found in other samples due to damaged minutes, 96 well plates cover foil and other mediums. This greatly affects DNA automation robot and other liquid handling workstation. (29)

The mixing up of samples can occur throughout the analysis and clerical phase. There are concerns of Incidents involved crime samples as they would lead to serious miscarriage of justice. Incidents involved the mix-up of reference samples have also been detected in some occasion. The mixing up errors commonly occurs during the phase of samples collection, reagents mix-up in PCR, preparation of capillary electrophoresis and amplification of products. In 2012, two incidents involve the DNA profiling of multiple blood samples and the mixing up of samples during a collaborative exercise are still under investigation. Multiple blood samples from both cases failed to produce DNA profile due to unknown reason led to the suspicion of misconduct. (29)

In 2012, the NFI have reported 135 cases of contamination resulted from wrong reference samples, incorrect reagent and controls. Another 114 cases were reported to have been caused by misinterpretation and overlooked results due to human errors. The leakage of DNA samples caused by damaged containers and medium have resulted 19 cases of forensic failure and a further 34 cases were caused by samples mixed up. (29) Although these figures are devastating to the forensic-legal community as the reliability of DNA are being questioned, but considering the number of cases correct DNA still yield result with the highest accuracy. In comparison to other forensic methods, DNA should still be the preferable form of evidence. Almost 30% of errors in DNA analysis are caused by human errors and majority of DNA testing are performed for criminal and civil purpose. Therefore, the consequences of incorrect readings are devastating. According to the innocence project, over 20% of exoneree's are jailed due to contamination in samples and misinterpretation of results. (29)

There are trends indicating an increment in the total number of contaminations over the years. This is possibility due to an increase in the number of DNA analyses request and the introduction of a new analytical system known as Next Generation Multiplex. (29) In a 5 years period 135 cases were flagged by the NFI due to DNA contamination from staff member, and effectively 27% of all contamination cases were submitted within that time frame. 311 cases of forensic errors caused by sample mix-up were also flagged by the NFI for further investigation. A Total of 497 tests were found to have been compromised and it is only a tip of the iceberg, many other contributing factors can determine the success of a forensic analysis. In our society, criminal investigators and judges believed in the exponential potential of DNA and its minimal flaws. However as we are aware in the majority of crimes, only 5-10% of those contain incriminating biological evidence. (6) Therefore, majority of the cases have to go for less accurate methods including serology and hair samples. There are data signifying the "perfect" DNA is not perfect, but it is the best we currently have. This problem with DNA analyses can directly reflects on the performance of all other forensic tests where accuracy is comparatively lower. (29)

Table 3 – Error rates by the NFL in the years 2008-2012 (29)

Errors can be falsely match, falsely non-match or both causes. These errors are discovered by internal and external control.

	2008	2009	2010	2011	2012	Total
False DNA match	2	1	0	0	0	3
False DNA non-match	4	3	1	2	4	14
Both	0	2	0	0	2	4
Total	6	6	1	2	6	21

The consequences of invalid forensics can lead to complications across many sectors. In some scenarios the destruction of trace material could be the optimal outcome. Although, it is a serious failure but it wouldn't induce misleading evidence. The declaration of DNA profile false matching and false non-matching are currently the 2 types of errors focused by the NFI investigation. The false matching of DNA profile would create misleading evidence with serious impact. Quality procedures are in place to prevent such errors, but some do slip through leading to false matching. (29) During the period of 2008 to 2012, there are a total of 21 cases reported to have been lead to wrongful convictions or miscarriage of justice. 3 cases were resulted from false matching and another 14 were caused by false non-matching. The combination of false matching and false non-matching in the same instance also have a relative high frequency of appearance, data have suggested 4 cases of forensic failure are caused by both kinds of error. However these statistical data do not reflect on the true frequency. Seemingly these cases were only statically included by NFI report if they have caused miscarriage of justice. The NFI did not systematically register near miss match/non-match errors. Only partial statistics were recorded, some events with potential to lead to wrongful matching are not recorded due to believe in their preventative measure, which would stop errors reaching the final phase of DNA analysis. The establishment of a reliable system in recording near misses and actual errors should be considered to provide statistic with true value. (29)

Fortunately, some of the errors do not have catastrophic impact due to rectification at later stage. During the course of 5 years, 1482 cases of quality issues have been flagged within the Netherlands Forensic Institute. Approximately 28% of those quality issues did not cause any adverse outcome 50% of the cases are within the repairable parameter. On the other hand the remaining 22% of the quality issues were irreversible. The DNA profiles produced are either falsely matched or falsely non-match, which led to serious consequences in the legal-forensic sector. Within the 22% population, only 43% of the quality issue have no impact on the final outcome. The remaining have resulted adverse outcome in an irreversible manner. These errors are later stated in the final forensic report, but harm has already been done. (29)

The flaws with Impression evidence

Other than the possible errors within our forensic techniques, the interpretation of results have also been linked to the serious misconduct in the manner of falsified results, intentionally misleading judges to achieve conviction. The first 56 exoneree's rescued by the innocence project have been convicted based on misleading or fabricated evidence provided by forensic expert. (19) The risks of fabrication results can take place at the initial phase of crime scene investigation. Planting, destruction and mishandling of evidence can easily be done when unnoticed to falsify incriminating evidence. Once the samples reach the laboratory,

illegal steps could be taken to deviate from facts. Forensic Scientists or Lab technician are entrusted with responsibility to base their report on findings. In some instance, drylabbing and other forensic misconduct are found. In no doubt, forensic fraud can lead to wrongful conviction. Jurors and judges make their consideration based on forensic findings, omissions; inflated statistic, fraudulent testimonies and other form of forensic fraud could lead to miscarriage of justice. (19)

Confirmation bias is similar to our memory and it is subject to faults. Human naturally induces bias into their thought process, unknowingly derailing their truth. The degree of confirmation bias varies and it can infect thought, judgement and actions. This mainly occurs in impression comparison involving fingerprint analysis, and other form of forensic human identification. Confirmation bias is often introduced during the analysis phase of a research, the absence of standard made it extremely difficult to give definite answer. Technician are known to have used ACE (Analyse the latent, compare it to the suspect's exemplars, and evaluate) to help identify similarity or differences between two impression. However description for comparison, evaluation and conclusion are missing, which means the task lies on the judgment of the technician performing the test. (43) Judgement can vary between different individuals and therefore it is a less reliable form of evidence. In some scenarios, multiple expert opinions were sought and they can give totally opposite verdict. The prosecutor normally would only summon the incriminating expert witness, which tips the balance of a fair trial. Some studies have been conducted on fingerprint experts, and irrelevant information given to fingerprint expert could alter their judgement and can possibly change their interpretations about an investigation. Comparison evidence often contain uncertain features in their measurement or specification, the vague samples are also subjected to distortion. In the past, there are cases where the innocent were prosecuted and later released due to misidentification.

Currently, there are no standardised procedures in recruiting expert opinions. Typically, facial experts are given a set of incriminating images alongside referencing images to provide a subjective opinion with possible degree of 'confirmation bias' to the judge. (4) The psychological impact has been extensively researched where numerous literatures suggest extraneous information, for example the police suspicion and portraiture of the suspect has a tendency to generate "confirmation bias" during the identification process. (44)

Furthermore, in comparison and analysis phases, facial experts have no standardised operating procedures in handling and processing evidence. Evidence generated via facial mapping techniques somewhat provides purely opinion based verdicts where statistical data was solely not present. Hence, facial experts are classified as "self-certificated". Currently, no experts have demonstrated methods for overcoming issues caused by systematic errors. As mentioned earlier, the daunting impact of distortions and other issues often void the reliability of the evidence itself. (4 & 44)

Expert witnesses often carry the image of a reputable individual who gives opinions using their extensive expertise in a specific area. However, they also carry a false sense of security when summoned in court. The jury can sometimes overlook possible human errors involved in different evidence analysing techniques. In most scenarios, incriminating subjective opinions in an area where the jury have insufficient knowledge in can skew the decision making capability of the judge himself. It is common for judges to rely on expert witnesses on their final verdicts. However, unlike other forms of evidence, facial recognition has no

empirical data backup. Possible misidentification can occur quite frequently and issues from distortion and perspective can affect how an individual appear on images. Therefore, expert witnesses should always warn judges prior to making a statement in court. (4 & 44)

Wrongful Conviction: Legal Cause

Ineffective Assistance of Counsel

The downfall of our justice system contributes a significant part in wrongful conviction. As mentioned earlier the incompetency of lawyers have directly or indirectly resulted the conviction of many innocence. The staggering 77% figures are almost overwhelming in the legal aspect of forensic. The ideal of wrongful conviction is traumatising alone. To tackle this specific problem in law point of view, the defence must raise awareness to the ineffective counselling leading to an unfair trial. To generate common ground for appeal, the defendant would require solid evidence which is capable of raising disputable doubts. This involved direct condemnation of the previous appointed attorney. However appeal using the performance of the attorney as a sole reason is not always successful. The defence must have sufficient evidence to persuade the judge of other possibilities and the standard of the trial are unacceptable. The Supreme Court is empowered to review evictions if there is suspicion of foul play or any other factors tipping the balance of the jurisdiction. The exoneration process can be lengthy if solid or the persuasive evidence are not readily available. (26)

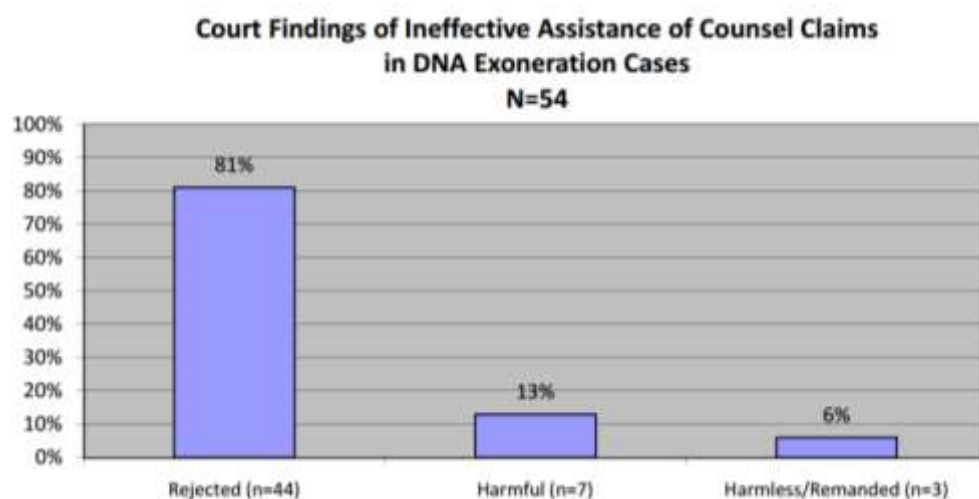


Figure 6 – Court findings of ineffective assistance of counsel claims (26)

This graph shows the first 54 DNA exoneration cases appealed by claiming ineffective counselling. 81% appellant has been rejected, 13% have sentence reversed and another 6% remanded for retrial.

To overturn a conviction using ineffective counselling as the main reason, the defence must be able to demonstrate a high level of ineffectiveness causing unfair trials. In the famous Strickland vs. Washington case, two prong tests was used by the supreme court to determine the attorney's ineffectiveness. The low standard set by this case led to difficulties in proving ineffective counselling. This effectively raised the burden in exoneration; it is difficult to gain post-conviction relief via claims of ineffective concealing. A study conducted by the National Safety Council (NSC) suggested ineffective counselling is frequently used for post-conviction appeal. Nearly half of the appeal submitted within the United State involved allegation of

ineffective counselling. Yet only 8% have successfully appeal and received reliefs. (26) This also complies with the statistical data collected by the innocence project. 21% of the first 54 exonoree's rescued by the project have raised claim of ineffective counselling. In figure 6, 81% of the cases were rejected by court, in 19% of the cases the court agreed with the appellant and found ineffective counselling. 13% of that figure has fallen into the harmful category leading to the reversal of conviction. Another 6% has been remanded to the lower court for reviews. (26)

Conclusion

Unlike other reports, where you can get a degree of counter argument to give the reader a clearer view of the processes involved. In wrongful conviction it seems it deviates from the norm, statistical data implemented are collect by third parties and mostly government officials. Therefore most of which are solid facts and the number could have only been undermined to avoid reputation damage, and affecting public trust. However, all of the findings suggested within this report do contribute to wrongful conviction. The main culprit of wrongful conviction rests upon forensic failure and false eyewitness testimonies. The highly anticipated DNA profiling has been critically analysed to demonstrate the possible faults that could occur within this close to flawless technology. This is a role model that would directly reflect on other less accurate form of forensic method including serology and hair analysis. Eyewitness testimonies have a submission rate of 70% throughout the investigation process, but it can be manipulated by the administrators to yield desirable incriminating testimonies. Other than police misconduct the memory of the eyewitness is also in doubt, the pressure in identification often push the eyewitness to make a select. External factors can also distort the perpetrator making recognition difficulty.

To conclude, the factors suggested are not the sole cause of wrongful conviction. Each case submitted contains its own element of uniqueness. It often occurs in the combination of multiple factors where every effort has been made by the public sector to avoid miscarriage of justice. Science shares the same fate as other large organisation and system, where there are always flaws due to its scale. The establishment of standard protocol to aid identifying and rectify the problems are currently the only approach. Measures have been put up to minimise further increment of wrongful convictions. However, wrongful conviction is unavoidable unless a large reformation of the justice system takes place. Nonetheless, even if reformations do occur, a new wave of problems could rise.

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