AI - Preventive Policing and Public Health:
Analysing Risk Factors and Forecasting Needs with Generative AI

An Oxon Advisory White Paper 02/24

Series: Emerging Technologies and Strategies for Public Safety

Oxon Advisory

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AI - Preventive Policing and Public Health: Analysing Risk Factors and Forecasting Needs with Generative AI

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About Oxon Advisory:

Oxon Advisory (OXA) is a global strategic advisory and think tank specialising in enhancing public safety through collaborative partnerships and evidence-based approaches. With a team of expert associates possessing diverse skills in research, policy, technology, and community engagement, OXA is uniquely positioned to guide the implementation of innovative solutions like those presented in this paper. OXA's expertise lies in:

- **Data Collaboration and Analysis:** Supporting secure and effective data sharing across agencies.
- **Artificial Intelligence and Machine Learning:** Designing and implementing AI-driven solutions for data visualisation, risk identification, and resource allocation.
- **Strategic Partnerships:** Building collaborative networks to address complex public safety challenges.
- **Training and Capacity Building:** Equipping professionals with the knowledge and skills to implement and utilise new technologies and approaches.

Preface

The landscape of public safety is undergoing a profound transformation. Advances in technology, shifting societal expectations, and the evolving nature of crime itself demand a new approach to policing and community safety. Oxon Advisory is committed to providing thought leadership and practical guidance to navigate this complex terrain.

This White Paper, focusing on police reform in the UK, marks the first in a series dedicated to exploring **Emerging Technologies and Strategies for Public Safety**. This series will delve into the most pressing challenges facing law enforcement and community safety leaders, offering evidence-based insights and innovative solutions.

Future white papers in this series will examine topics such as:

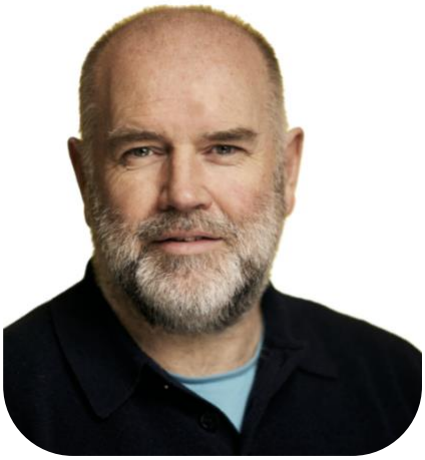
- **Police Reform.**
- **Neuro-disabilities, crime and criminal justice.**
- **Child Rights for those in contact with justice services.**
- **The role of technology in preventing and responding to cybercrime.**
- **Building community resilience in the face of terrorism and extremism.**
- **Data-driven strategies for crime prevention and reduction.**
- **The future of policing in a rapidly changing world.**

We believe that by fostering dialogue, promoting collaboration, and embracing innovation, we can build a safer and more secure future for all. This series is our contribution to that vital endeavour.

Oxon Advisory
October 2024

A New Era for Public Safety:
Embracing Innovation and Collaboration

A Foreword from Professor Stan Gilmour KPM FRSA, CEO of Oxon Advisory



As we navigate an increasingly complex and interconnected world, the challenges facing our communities are evolving at an unprecedented pace. Traditional approaches to public safety are often reactive, struggling to keep up with the dynamic nature of crime, social unrest, and public health crises. To truly enhance community well-being and build a safer future, we must embrace innovation and forge new pathways for collaboration.

This white paper series, **"Emerging Technologies and Strategies for Public Safety,"** represents Oxon Advisory's commitment to exploring and promoting cutting-edge solutions that empower communities and public service agencies to proactively address these challenges. We believe that by harnessing the power of emerging technologies like generative AI, coupled with robust data sharing and collaborative partnerships, we can achieve a paradigm shift in how we approach public safety.

This series will delve into a range of critical topics, examining the potential of innovative technologies and strategies to:

- **Enhance preventive policing:** By analysing complex data and identifying risk factors, we can move beyond reactive responses and implement proactive interventions that address the root causes of crime.
- **Improve public health outcomes:** Through predictive modelling and early intervention, we can better anticipate and respond to public health crises, safeguarding the well-being of our communities.
- **Strengthen community resilience:** By fostering collaboration and empowering communities with data-driven insights, we can build stronger, more resilient societies capable of navigating complex challenges.

- **Promote ethical and responsible technology use:** As we integrate these powerful technologies, we must prioritise ethical considerations, ensuring transparency, accountability, and the protection of individual rights.

Oxon Advisory is dedicated to supporting organisations in navigating this transformative journey. We offer a unique blend of expertise in data collaboration, AI implementation, strategic partnerships, and capacity building, enabling us to guide the ethical and effective adoption of these innovative solutions.

This series is an invitation to join us in exploring the frontiers of public safety, to embrace the potential of emerging technologies, and to forge collaborative pathways towards a safer, healthier, and more resilient future for everyone.

Stan Gilmour

Professor Stan Gilmour KPM FRSA

CEO, Oxon Advisory

Executive Summary:

This white paper explores the transformative potential of generative AI and multi-agency data sharing in revolutionising preventive policing and public health strategies. By analysing complex risk factors and forecasting needs, this approach empowers law enforcement and public health agencies to shift from reactive responses to proactive interventions. Generative AI can analyse vast datasets from various sources, identifying patterns and trends that may not be apparent through traditional methods. This enables the identification of high-risk individuals, vulnerable populations, and potential crime hotspots, facilitating targeted interventions and resource allocation.

Multi-agency data sharing provides a holistic view of individuals and communities, enabling early identification of risk factors and the development of tailored interventions. This collaborative approach fosters communication and coordination between agencies, leading to a more effective response to community safety challenges. The white paper also delves into the ethical considerations surrounding data privacy, algorithmic bias, and transparency, emphasising the importance of responsible and ethical implementation. Oxon Advisory, with its expertise in data collaboration, AI implementation, and strategic partnerships, is committed to supporting organisations in harnessing this potential to create safer, healthier, and more resilient communities.

1. Introduction

Traditional approaches to law enforcement and public health often focus on reacting to incidents after they occur. However, a proactive, preventive approach is essential to address the underlying social factors that contribute to crime and poor health. Generative AI, coupled with secure multi-agency data sharing, offers a groundbreaking opportunity to shift from reaction to analysis and prevention by identifying and addressing these root causes. Oxon Advisory, with its expertise in building collaborative partnerships and implementing data-driven solutions, is committed to supporting organisations in harnessing this potential.

2. Generative AI and Multi-Agency Data Sharing: A Synergistic Partnership

This partnership leverages the strengths of both generative AI and multi-agency data sharing to create a powerful and proactive approach to community safety. By combining cutting-edge technology with comprehensive data, we can move from reactive responses to preventive interventions that address the root causes of crime and improve community well-being.

Generative AI:

- **Analysing Vast Datasets:** Generative AI excels at sifting through massive volumes of data from various sources, including crime reports, social media, public health records, economic indicators, and environmental data. This allows for the identification of complex patterns and trends that may not be apparent through traditional analysis methods.
- **Identifying Complex Patterns:** By recognising subtle correlations and anomalies within the data, generative AI can help pinpoint high-risk individuals, vulnerable populations, and potential crime hotspots. This enables targeted interventions and resource allocation for maximum impact.

- **Generating Synthetic Data for Scenario Planning:** Generative AI can create realistic but anonymised synthetic datasets that mirror real-world data. This allows law enforcement and public health agencies to simulate various scenarios, test intervention strategies, and predict potential outcomes without compromising privacy.
- **Forecasting Future Trends:** By analysing historical data and current trends, generative AI can forecast future crime patterns, public health crises, and social unrest. This allows for proactive planning and resource deployment to mitigate potential risks before they escalate.
- **Identifying Bias:** A recent study highlighted by The Guardian revealed a concerning example of bias within the justice system. Family court judges in England and Wales were found to sometimes use victim-blaming language in domestic abuse cases. This underscores the deeply ingrained biases that can persist even within institutions designed to uphold justice. AI can play a crucial role in identifying and mitigating such biases by analysing e.g., court transcripts and judgments, identifying patterns of language and decision-making that may indicate bias. This can help to raise awareness, improve accountability, and develop objective standards for unbiased decision-making.
- **Assisting Frontline Decision-Makers:** Generative AI can be harnessed to provide direction and guidance to frontline staff to assist them in risk assessment and help guide them and those they are in contact with to successful outcomes.

Multi-Agency Data Sharing:

- **Holistic View of Individuals and Communities:** Secure data sharing across law enforcement, public health agencies, social services, education providers, and community organisations provides a comprehensive understanding of individuals and communities. This enables a more nuanced and informed approach to interventions, considering all relevant factors.
- **Early Identification of Risk Factors:** By sharing data, agencies can identify individuals and communities at risk of crime, violence, substance misuse, or other

public health concerns. This allows for early intervention and support services to prevent negative outcomes.

- **Targeted Interventions and Support:** Multi-agency data sharing facilitates the development of tailored interventions based on individual and community needs. This may include providing mental health services, substance abuse treatment, educational support, or social assistance programs.
- **Improved Resource Allocation:** By understanding the specific needs of different communities, resources can be allocated more effectively to areas with the greatest need. This ensures that interventions are targeted and efficient.
- **Enhanced Collaboration and Communication:** Data sharing fosters collaboration and communication between agencies, leading to a more coordinated and effective response to community safety challenges.

Examples of Applications:

- **Resource Planning:** Generative AI can analyse crime data to identify potential hotspots and deploy resources proactively.
- **Early Intervention for at-Risk Youth:** By identifying youth at risk of gang involvement or criminal activity, social services and community organisations can provide mentorship, counselling, and educational opportunities.
- **Public Health Crisis Response:** Generative AI can model the spread of infectious diseases or substance abuse outbreaks, allowing law enforcement and public health agencies to implement targeted prevention and intervention strategies.
- **Community Violence Prevention:** By analysing social media and other data sources, law enforcement and community organisations can identify potential conflicts and intervene, interrupt, and de-escalate tensions.

Ethical Considerations:

- **Data Privacy and Security:** Robust data protection measures must be implemented to ensure the privacy and security of sensitive information.

- **Algorithmic Bias:** AI models must be carefully evaluated to avoid perpetuating existing biases and ensure fairness in decision-making.
- **Transparency and Accountability:** The use of generative AI and multi-agency data sharing should be transparent and accountable to the public.

Summary:

- **Generative AI:** This cutting-edge technology can analyse vast datasets from diverse sources, identify complex patterns, and generate synthetic data for scenario planning and forecasting.
- **Multi-Agency Data Sharing:** Securely sharing data across law enforcement, public health agencies, social services, education providers, and other relevant organisations provides a holistic view of individuals and communities, enabling more informed interventions.

3. Expanding on the Use of Generative AI for Preventive Public Health and Community Safety

Generative AI offers powerful tools for analysing complex datasets and identifying patterns that humans might miss. In the context of preventive public health approaches to community safety, this technology can be invaluable for law enforcement agencies and their public partners. AI can be used in many different scenarios, including:

Analysing Risk Factors and Forecasting Needs:

Socioeconomic Factors: Socioeconomic disadvantage is a well-established risk factor for crime and poor health. Generative AI can analyse data on income levels, unemployment rates, housing conditions, and educational attainment to identify communities facing significant socioeconomic challenges. This information can guide the development of targeted programs aimed at poverty reduction, job creation, affordable housing initiatives, and educational support. Factors include:

- **Income levels:** AI can identify communities with high poverty rates, where residents may face increased stress, limited opportunities, and a higher likelihood of engaging in crime.
- **Unemployment rates:** High unemployment can contribute to social unrest and crime. AI can pinpoint areas needing job creation programs and economic support.
- **Housing conditions:** Substandard housing is linked to poor health and social problems. AI can help identify areas needing housing improvements or affordable housing initiatives.
- **Educational attainment:** Low educational attainment is correlated with higher crime rates. AI can identify areas needing educational investments and support programs.

Environmental Factors:

The physical environment plays a crucial role in community well-being. Generative AI can analyse data on environmental factors such as exposure to pollution, access to green spaces, and the quality of infrastructure. By identifying areas with high pollution levels, limited access to parks, or inadequate infrastructure, AI can inform environmental regulations, urban planning initiatives, and resource allocation to promote healthier and safer environments. Factors include:

- **Exposure to pollution:** AI can map areas with high pollution levels, which can contribute to poor health and increase vulnerability to crime. This data can inform environmental regulations and remediation efforts.
- **Access to green spaces:** Access to parks and green spaces promotes mental and physical health. AI can identify areas lacking green spaces and guide urban planning initiatives.
- **Quality of infrastructure:** Poor infrastructure can contribute to social isolation and hinder access to essential services. AI can identify areas needing infrastructure improvements.

Health Factors:

Access to healthcare, the prevalence of chronic diseases, and mental health indicators are all critical factors in community well-being. Generative AI can analyse health data to identify communities with limited access to healthcare, high rates of chronic diseases, or a prevalence of mental health challenges. This information can guide the development of targeted health interventions, resource allocation for healthcare services, and mental health support programs. Factors include:

- **Access to healthcare:** Limited access to healthcare can exacerbate existing health problems and contribute to crime. AI can identify areas with poor healthcare access and guide resource allocation.
- **Prevalence of chronic diseases:** High rates of chronic diseases can be an indicator of the prevalence of the kind of social determinants that also lead

to crime, straining community resources and increasing vulnerability. AI can identify areas needing targeted health and social care interventions.

- **Mental health indicators:** Poor mental health is a significant risk factor for crime. AI can identify areas needing increased mental health support services.

Crime Data:

Analysing crime data is essential for understanding crime patterns and developing effective prevention strategies. Generative AI can analyse crime rates, types of offences, and locations of incidents to identify high-risk areas and tailor interventions accordingly. This data-driven approach can help law enforcement agencies optimise resource allocation and implement evidence-based strategies to reduce crime. Data includes:

- **Crime rates:** AI can analyse crime rates across different areas and identify hotspots needing increased law enforcement presence or preventive interventions.
- **Types of offences:** Analysing the types of crimes prevalent in an area can help tailor interventions. For example, areas with high rates of property crime might benefit from different strategies than areas with high rates of violent crime.
- **Locations of incidents:** Mapping crime locations can reveal patterns and identify high-risk areas needing focused attention.

Social and Behavioural Factors:

Social connections, community engagement, and substance abuse rates are all important indicators of community well-being. Generative AI can analyse social and behavioural data to identify communities with weak social connections, low levels of civic participation, or high rates of substance abuse. This information can guide the

development of community-building initiatives, programs to promote civic engagement, and increased access to addiction treatment and prevention services.

Factors include:

- **Social connections:** Strong social connections contribute to community well-being and resilience. AI can identify areas with weak social connections and guide community-building initiatives.
- **Community engagement:** High levels of community engagement are associated with lower crime rates. AI can identify areas needing initiatives to promote civic participation.
- **Substance misuse rates:** Substance misuse is a major indicator of need and a risk factor for crime. AI can identify areas needing increased access to addiction treatment and prevention programs.

4. Trauma-Informed Communities and Public Partnerships:

The pervasive impact of trauma on individuals, families, and communities necessitates a comprehensive and collaborative response. Trauma-informed care, which recognises the widespread impact of trauma and understands potential paths for recovery, is essential for addressing the root causes of adverse outcomes and promoting healing. However, implementing trauma-informed practices across diverse sectors requires effective coordination and resource allocation. This is where generative AI can be a game-changer, particularly in the context of public partnerships.

Generative AI: A Catalyst for Trauma-Informed Communities

Generative AI, with its ability to analyse vast datasets and identify patterns, can be a powerful tool for creating trauma-informed communities. By leveraging AI, public partnerships can:

- **Identify High-Risk Populations:** Generative AI can analyse data from various sources, including adverse childhood experiences (ACEs) studies, crime statistics, and social service records, to identify communities with high trauma prevalence. This allows for targeted interventions and resource allocation to areas with the greatest need.
- **Predict Service Needs:** AI algorithms can forecast the demand for trauma-informed services, such as mental health counselling, substance misuse treatment, and support groups. This enables proactive planning and resource allocation, ensuring that services are available when and where they are needed most.
- **Facilitate Cross-Sector Collaboration:** Generative AI can help break down data silos between different agencies and organisations, facilitating a more holistic understanding of trauma within a community. This can lead to more effective collaboration and coordination of services across sectors, such as healthcare, education, social services, and law enforcement.
- **Personalise Trauma-Informed Interventions:** AI can analyse individual-level data to identify specific needs and risk factors, allowing for personalised interventions and support. This can lead to more effective treatment and recovery outcomes.

- **Evaluate Program Effectiveness:** By analysing data on program outcomes, AI can help determine which trauma-informed interventions are most effective in promoting healing and resilience. This allows for continuous improvement and optimisation of services.

Building Effective Public Partnerships

The successful implementation of generative AI in trauma-informed care requires strong public partnerships. These partnerships should include:

- **Government Agencies:** Local, regional, and national government agencies can provide funding, data access, and policy support.
- **Community Organisations:** Grassroots organisations and non-profits bring valuable local knowledge, community trust, and direct service delivery experience.
- **Technology Providers:** AI developers and technology companies can provide the necessary tools and expertise for data analysis and implementation.
- **Researchers and Academics:** Research institutions can contribute to the evidence base for trauma-informed AI applications and evaluate program effectiveness.

Ethical Considerations and Challenges

While generative AI offers tremendous potential, it is crucial to address ethical considerations and potential challenges:

- **Data Privacy and Security:** Protecting sensitive personal information is paramount. Strict data governance frameworks and de-identification techniques must be implemented.
- **Algorithmic Bias:** AI algorithms can perpetuate existing biases if not carefully designed and monitored. Ensuring fairness and equity in AI applications is critical.
- **Community Engagement:** Meaningful community engagement is essential to ensure that AI applications are culturally relevant and address the specific needs of diverse populations.

- **Inter-Agency Collaboration:** Establish clear protocols and governance frameworks for effective data sharing and collaboration between agencies. OXA has extensive experience in facilitating such collaborations.

Summary:

Generative AI has the potential to revolutionise the way we address trauma in our communities. By harnessing the power of AI, public partnerships can create more effective, equitable, and responsive trauma-informed systems of care. This will lead to improved outcomes for individuals, families, and communities affected by trauma, fostering healing, resilience, and social well-being.

Generative AI can be instrumental in creating trauma-informed communities by:

- **Identifying populations with high trauma prevalence:** Analysing data on adverse childhood experiences, exposure to violence, and other traumatic events can help identify communities needing trauma-informed services.
- **Predicting service needs:** AI can forecast the demand for trauma-informed mental health services, support groups, and other resources.
- **Evaluating the effectiveness of trauma-informed interventions:** AI can analyse data on program outcomes to determine what interventions are most effective in promoting healing and resilience.

5. Law Enforcement and Wider Public Partnerships:

Effective community safety requires collaboration between law enforcement agencies and a wide range of public partners, including social service agencies, healthcare providers, community organisations, and educational institutions. Generative AI can facilitate this collaboration by breaking down data silos and enabling the sharing of critical information between agencies. By identifying overlapping needs and opportunities for joint interventions, AI can help foster a coordinated and comprehensive approach to community safety. This collaborative approach, guided by AI-powered insights, can lead to more effective and sustainable solutions for addressing the complex challenges facing communities.

AI can facilitate collaboration between law enforcement and public partners by:

- **Sharing data and insights:** AI can help break down data silos and enable the sharing of critical information between agencies.
- **Identifying opportunities for joint interventions:** AI can identify areas where collaborative efforts between law enforcement, social services, healthcare providers, and community organisations can have the greatest impact.
- **Coordinating resources:** AI can help ensure that resources are allocated efficiently and effectively to address the most pressing needs.

Operational use cases for Law Enforcement and Public Health:

- **Early Intervention Programs:**
    - Identify individuals and communities at risk and provide targeted support services, such as mentoring programs, educational opportunities, and mental health counselling.
- **Community-Based Initiatives:**
    - Develop and implement community-driven programs focused on improving social conditions, promoting positive youth development, and fostering social cohesion.
- **Resource Allocation:**

    - Optimise the allocation of resources (e.g., funding, personnel) to areas and populations with the greatest need.
- **Policy Development:**
    - Inform the development of evidence-based policies aimed at addressing the root causes of crime and poor health.
- **Frontline Guidance:**
    - Applications can be built that provide direction and guidance for frontline operators to help them manage risk and navigate them, and those they engage with, though to a successful outcome.

By harnessing the power of generative AI, law enforcement agencies and their public partners can move towards a more proactive and preventive approach to community safety and well-being. This technology can help identify risk factors, forecast needs, and tailor interventions to create safer, healthier, and more resilient communities.

6. Oxon Advisory's Role in Supporting Implementation

Oxon Advisory offers a comprehensive suite of services to support the ethical and effective implementation of generative AI and multi-agency data sharing:

- **Strategic Planning:** Developing roadmaps for integrating these technologies into existing workflows.
- **Technology Assessment and Selection:** Identifying and evaluating suitable AI tools and data sharing platforms.
- **Training and Capacity Building:** Providing customised training programs for law enforcement and public health professionals.
- **Ethical and Legal Guidance:** Ensuring compliance with data protection regulations and ethical guidelines.
- **Evaluation and Impact Assessment:** Measuring the effectiveness of implemented solutions and identifying areas for improvement.

Conclusion

Generative AI and multi-agency data sharing offer a paradigm shift in preventive policing and public health, promising a future where communities are safer, healthier, and more resilient. By harnessing these technologies responsibly and ethically, we can move beyond reactive strategies and embrace proactive interventions that address the root causes of crime and public health challenges. However, this transformative journey is not without its challenges. Realising the full potential of these technologies requires careful navigation of complex ethical, legal, and practical considerations.

This White Paper has outlined the potential benefits and applications of this approach, emphasising the importance of trauma-informed communities and public partnerships in addressing the root causes of adverse outcomes. It has also highlighted the crucial role of ethical considerations, including data privacy, algorithmic bias, and transparency, in ensuring the responsible and equitable implementation of these powerful tools.

While the potential benefits are significant, there are critical pressure points that demand careful attention:

- **Data Privacy and Security:** Protecting sensitive personal information is paramount. As agencies share data, the risk of breaches and misuse increases. Robust security measures, strict data governance frameworks, and de-identification techniques are essential to safeguarding individual privacy and maintaining public trust. This is particularly acute when dealing with vulnerable populations, where the consequences of data breaches can be devastating.
- **Algorithmic Bias:** AI models are only as good as the data they are trained on. If the data reflects existing societal biases, the algorithms will perpetuate and even amplify those biases, leading to unfair and discriminatory outcomes. Addressing algorithmic bias requires careful data selection, ongoing monitoring, and auditing of algorithms to ensure fairness and equity in decision-making. This is a particularly acute pressure point in law enforcement, where biased algorithms can lead to disproportionate targeting of certain communities.
- **Transparency and Accountability:** The use of generative AI and multi-agency data sharing must be transparent and accountable to the public. Clear communication about how these technologies are being used, the safeguards in place to protect individual rights, and mechanisms for redress in case of errors or misuse are crucial for building and maintaining public trust. Lack of transparency can lead to suspicion, fear, and resistance to the adoption of these technologies.
- **Inter-Agency Collaboration:** Effective implementation requires seamless collaboration between agencies, which can be challenging due to differing organisational cultures, data systems, and legal frameworks. Establishing clear protocols, data sharing agreements, and governance frameworks is essential for successful collaboration. Building trust and overcoming inter-agency rivalry can be a significant hurdle, particularly in cases where agencies have historically operated in silos.
- **Resource Allocation:** Implementing these technologies requires significant investment in infrastructure, training, and ongoing maintenance. Securing adequate funding and ensuring equitable resource allocation across agencies and communities can be a challenge, particularly in resource-constrained environments. Failure to invest adequately can lead to disparities in access and outcomes, further exacerbating existing inequalities.

Oxon Advisory is dedicated to partnering with organisations to navigate this transformative journey, providing strategic planning, technology assessment, training, ethical guidance, and evaluation services. Through collaborative efforts and a commitment to innovation, we can overcome these challenges, achieve meaningful outcomes, and create a positive impact on community safety and well-being. By addressing these pressure points proactively and collaboratively, we can harness the full potential of generative AI and multi-agency data sharing to build a safer, healthier, and more equitable future for everyone.

Call to Action:

- Invest in research and development of ethical generative AI applications for analysing risk factors and forecasting needs.
- Develop robust data sharing frameworks that prioritise privacy and security.
- Foster collaboration between agencies and stakeholders to maximise the benefits of these technologies.
- Engage with Oxon Advisory to access expert guidance and support in implementing these innovative solutions.

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