

Systematic review of blue-light service collaboration for community health and well-being

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ABSTRACT

Effective cross-service collaboration has been posed as a way of improving outcomes for people, enhancing community safety and well-being, reducing social and health inequalities, and improving service resource efficiencies. However, it was not known what evidence and frameworks existed for service leads to reform collaborative public service responses.

This systematic review aimed to summarize evidence to understand best ways for police, fire, and ambulance services to collaborate to improve community safety and well-being. Standard methodology was used following PRISMA guidance. The search strategy optimized report retrieval from a broad range of academic databases, grey literature, and citation hand-searching from January 2012 to March 2022. Endnote 8 supported data management. Eligible reports explored collaboration benefits between any two emergency services to improve any aspect of community safety or well-being and had to provide relevant extractable information. Critical appraisal and syntheses of findings were conducted. Studies could originate from any country. Records were screened and retrieved by one author and included reports independently double-screened.

From the academic databases, 4,648 reports were identified and screened, of which 25 reports were retrieved and assessed for eligibility, but no relevant studies were retained following full text review. A further 27 records were identified from websites and citation searching, of which three were included following eligibility checks. The scant evidence uncovered in this review tentatively suggests service collaboration initiatives have potential for decreased resource use, increased public confidence, faster responses, increased survival rates, and reduced unnecessary emergency responses. Robust evidence is needed to influence policy and practice.

Key Words Police, fire, and ambulance joint response; emergency response; inequality; resource use; partnership working; connected working.

INTRODUCTION

Rationale

The benefits of cross-service collaboration have been posed as a means to improve outcomes for people, enhance community safety and well-being, reduce social and health inequalities, create better models of partnership working, and resource efficiencies for services (Christie Commission on the Future Delivery of Public Services, 2011; O'Neill & McCarthy, 2014; Rummery, 2009; Strudwick et al., 2022). In Scotland, the Christie Report acknowledged public service collaboration was central to achieving a fair society, being especially relevant in protecting those most vulnerable in society (Christie Commission on the Future Delivery of Public Services, 2011).

The Chiefs of Police Scotland, Scottish Fire & Rescue Service and Scottish Ambulance Service established the

Reform Collaboration Group (RCG) to build collaboration aimed at improving outcomes for people in Scotland (Scottish Emergency Services National Collaboration Strategy, 2018). However, it was not known what UK or international evidence existed to inform the RCG collaborative project development strategies, whether individual outcomes were improved or intended benefits to services realized along with associated efficiencies. The RCG commissioned this review (Scottish Institute for Policing Research, 2021) to provide evidence to inform their project development work.

Aim and Objectives

This review aimed to summarize relevant literature to understand best ways of police, fire, and ambulance services collaboration to improve community safety and well-being.

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The specific objectives were to establish what international evidence existed for effective collaboration between the three “Blue Light” emergency services for: community safety and well-being; reducing social and health inequities; primary, secondary, or tertiary prevention; best conditions for collaborative benefits including methodology and frameworks; cost-effective use of resources.

METHODS

This systematic review was completed to PRISMA reporting guidelines (Page et al., 2021).

Eligibility Criteria

Studies were included if they: explored effectiveness/benefits including costs of cross-service collaboration (police, fire, ambulance) to provide improvements in community safety and well-being or reductions in social and health inequalities; provided sufficient information regarding aims, methods, focus, findings, and conclusions; published in English since January 2012.

Information Sources

Databases searched were: ASSIA; Sociological Abstracts; Social Services Abstracts; MEDLINE, PsycINFO, Social Care Online, Social Policy & Practice, Social Services Abstracts; Science Citation Index Expanded; Social Sciences Citation Index; Arts & Humanities Citation Index; Emerging Sources Citation Index; Conference Proceedings Citation Index Science; Conference Proceedings Citation Index Social Sciences & Humanities; Book Citation Index Science; Book Citation Index Social Sciences & Humanities; Campbell Collaboration. Past editions of the Journal of Emergency Management and International Journal of Emergency Services were hand-searched.

For the grey literature search, we performed extensive and iterative searches of Google and Google Scholar. We searched references and resources supplied by key national (including UK [College of Policing](#)) and international contacts regarding small-scale evaluations of change. We further augmented this via requests across our Twitter networks in March 2022. To check for Scottish relevance, we also searched websites of National Ambulance Research Steering Group ([NARSG Ambulance Research](#)); Fire Service Research and Training Trust via the portal Ignite ([research – FSRTT \(fire-trust.info\)](#)), and Scottish Institute for Policing Research ([SIPR](#)) including “select bibliography” of 2,945 records to March 2022.

Search Strategy, Selection, and Data Collection Process

Exploratory database searches were conducted for terms related to “Police or Fire or Ambulance” and combined with terms such as “Collaboration; Community safety; Wellbeing; Social inequalities; Health inequalities.” This exploratory pilot searching of the evidence did not identify relevant included studies but did refine our final search strategy with the following architecture:

1. exp Police/ or exp Ambulances/ or exp Firefighters/ or exp Emergency responders/ or (police or fire or ambulance).m_title or “rescue service”.m_title or (police and ambulance).m_title or (police and fire*).m_title or (ambulance and fire*).m_title or exp Police

Personnel/ or exp Fire Fighters/ or exp Paramedics/ or exp Emergency Services/

2. (Interagency collaboration) OR (integrated collaboration) OR (multiagency collaboration) OR (inter-professional collaboration) OR collaboration. M_title OR exp Interinstitutional Relations/ OR Interagency collaboration.af.
3. 1 AND 2
4. Limit 3 to published between January 2012 and March 2022

The search architecture above contained dedicated terms used in advanced evidence base searches (e.g., “exp” means “explode” to capture all narrower terms associated with broader concepts). Reports had to be written in English as there was no budget for translation. There was no geographical limit on location of studies. Search results were downloaded into a reference management system (EndNote 8). Studies were retained if they met eligibility criteria. One author (SMacG) screened each record, retrieved included reports, and collected data from each report. Included reports were independently double-screened and confirmed (ND). No automation tools were used.

Data Extraction, Critical Appraisal, and Synthesis Methods

Data were extracted for: study design, methods, populations, intervention used, main concept, and outcomes for tri- and bi-partite service collaborations. Extracted data were cross-checked and disagreements resolved by consensus (all authors). We assessed included studies using the Assessment of Real-World Observational Studies (ArRoWS) critical appraisal tool (Coles et al., 2021) the Assessment of Real-World Observational Studies (ArRoWS). The ArRoWS tool contains nine identified core items to quickly and easily assess the quality of real-world evidence studies.

Characteristics of included reports were tabulated, with key information highlighted. All authors met to review tabulated data and identified key concepts to reach overarching narrative themes.

RESULTS

Study Selection

Following the final search strategy for tri- or bi-partite collaboration, 4,648 academic reports were identified and screened, of which 25 reports were retrieved and assessed for eligibility, leaving no new relevant studies after full text review (see Figure 1).

Further iterative grey literature searching of many more thousands of potential documents and references resulted in 23 reports being retrieved, and, following eligibility assessment, three potential reports of interest were included (Bronsky et al., 2017; Elias et al., 2021; Emergency Services Collaboration Working Group, 2016). Contact with key experts and via Twitter elicited a small number of responses but did not yield any relevant reports. Given the apparent paucity of reports, care was taken to not exclude potentially relevant studies by retaining *any* with any relevance to community safety and well-being.

Excluded documents were tabulated, highlighting their focus and with comments on relevance, (see Supplemental

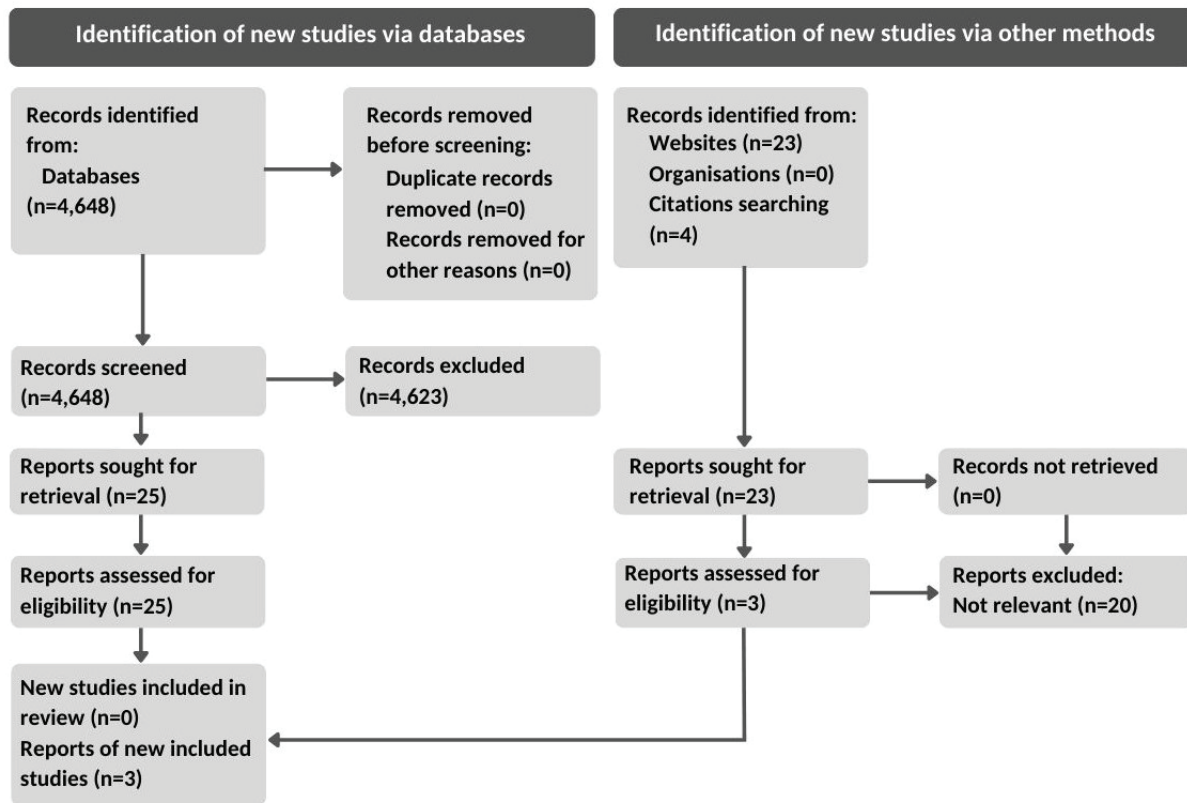


FIGURE 1 Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram

Table S1). Table S1 demonstrates these documents were not research or evaluations of collaboration between any blue-light services focussed on improvements in community safety and well-being, or reductions in social and health inequalities. Many documents were news items, and very few related to community safety and well-being.

Study Characteristics

The three grey literature reports provided some relevant data and were from Australia, the United States, and the United Kingdom (see Table I). The first described a specific program to respond to the needs of vulnerable older people with an alternative to hospital admission (Elias et al., 2021). The second was a specific community program improving outcomes for people who frequently use Emergency Departments (EDs) (Bronsky et al., 2017). The third report was a “National Overview” of several projects and initiatives across England and Wales (Emergency Services Collaboration Working Group, 2016), which summarized activities by six main headings: “First response and co-responding,” “Demand management and rationalisation,” “Shared estates and assets,” “Joint control rooms,” “Wider collaboration,” and “Strategic alliances and partnerships”, reported in more detail in Table II.

Critical Appraisal of Studies

Two included studies were empirical real-world observational studies, one using a case study approach of data collected via quality improvement and service evaluation (Elias et al., 2021)

and the other a retrospective program evaluation (Bronsky et al., 2017). We assessed these studies using the ArRoWS critical appraisal tool (Coles et al., 2021) the Assessment of Real-World Observational Studies (ArRoWS), finding some methodological issues, and Elias et al. offered more robust findings (see Table III).

Results of Individual Studies

The first included report was by Elias et al. (2021), based in New South Wales, Australia, and described the development, implementation, and initial evaluation of the Geriatric Flying Squad’s reciprocal referral pathways with emergency responders including Ambulance, Police, and Fire and Rescue. The program avoided 331 estimated 9-1-1 calls per month, 144 ED visits per month, and 52 hospital admissions per month (see Table I).

The second included report was by Bronsky et al. (2017) based in Colorado, United States, and focussed on a subset of individuals who were “super-utilizers” of ED services. A community-wide collaboration program, Community Assistance Referral and Education Services (CARES), comprised several providers who interacted at different points during each patient’s intervention according to individual needs. Providers included fire fighters and paramedics. The study was a retrospective pre- and post-program evaluation, and the median (interquartile [IQR]) monthly rate of 9-1-1 calls, ED visits, and hospital admissions statistically significantly decreased by 0.26 (–0.06, 0.90), 0.25 (–0.08, 0.71), and 0.18 (0.04, 0.53), respectively, ($p < 0.001$ for all; see Table I).

TABLE I Summary of three included reports*

Source (Date)	Focus	Relevance to the Review	Reference
<i>Journal of Integrated Care</i> (2021)	Describes the development, implementation and initial evaluation of the Geriatric Flying Squad's reciprocal referral pathways with emergency responders including New South Wales Ambulance, Police and Fire and Rescue. These innovative pathways and model of care were developed to improve access to multidisciplinary services for vulnerable community dwelling frail older people with the intent of improving health and quality-of-life outcomes by providing an alternative to hospital admission.	Case study describing the review of the Geriatric Flying Squad's referral database and quality improvement initiative to streamline referrals amongst the various emergency responders in the local health district. The implementation and initial evaluation of the project through online survey are further described.	Elias et al., 2021
<i>Prehospital Emergency Care</i> (2017)	A subset of individuals who inefficiently and frequently use emergency department (ED) services are called "super-utilizers." Community-wide collaboration program called CARES (Community Assistance Referral and Education Services) is comprised of several providers including intake and navigation teams, who interact at different time points during the patient's intervention according to individual needs.	Providers include fire fighters and paramedics.	Bronsky et al., 2017
The Emergency Services Collaboration Working Group National Report (2016)	Emergency Services Collaboration Working Group National Overview. The report provides examples of collaborative projects, plans and initiatives from across England and Wales.	Report (see Table II below for description of projects/initiatives and any outcomes)	Emergency Services Collaboration Working Group, 2016

*Table reproduced from the authors' report with permission from Scottish Institute for Policing Research (Dougall et al., 2023).

TABLE II Summary of the Emergency Services Collaboration Working Group 2016 report*

Focus of Collaborative Activity	Summary of Activity	Outcomes
1) First response and co-responding	Areas: London; Merseyside (Pilot); Greater Manchester; Wales (Mid and West); Essex; Hertfordshire.	—
First Response – Cardiac Arrest	Provision of defibrillators and training to blue-light services. In the event of suspected cardiac arrests, police and fire and rescue personnel are equipped to respond with automated external defibrillators (AEDs), providing prompter response times and increasing patients' chances of survival and subsequent quality of life.	Response times and survival rates were reported to have improved.
Emergency First Response (EFR)	The EFR scheme was set up to improve clinical outcomes and cardiac arrest survival rates with a focus on servicing rural communities. The scheme involves utilizing on-call firefighters to provide an EFR in collaboration with the ambulance service.	Response times were reported to have improved.
Community Safety Responders (CSRs) (Pilot)	CSRs perform the joint roles of Police A Community Support Officer (PCSO), retained on-call firefighter (RDS), and an emergency medical responder (EMR) were trained to attend ambulances. They provided Service Red 1 and 2 category calls from their base within the local fire and police stations.	No data
Telecare Response Service	Telecare equipment supports people to live safely and independently at home. Using special sensors, Telecare can detect potential emergencies at home (e.g., falls, wandering, medication, mismanagement, fire, flooding, carbon monoxide and gas leaks). Retained firefighters became first responders.	No data
Co-Responding	Co-responders are firefighters who are trained and assessed in basic life support procedures, including the use of AEDs and oxygen therapy.	Improvement in statutory response times seen. Costs savings noted (possibly due to decrease in fines for not meeting targets).
2) Demand management and rationalization	Areas: Essex; Hampshire (Pilot); Lancashire; Surrey/Sussex; West Midlands. Demand management and rationalization of services reduces harm by improving the capability of services to deal with incidents. The services can mobilize a faster response to incidents and performance is enhanced by improved interoperability.	—

Focus of Collaborative Activity	Summary of Activity	Outcomes
Forced Entry and Missing People	Not relevant to review	N/A
Revised Policy on Sudden Deaths	Not relevant to review	N/A
Clinical Support Desk – Triaging Calls	In London: Instead of automatically sending an ambulance response to all police requests, a dedicated team in the control room reviews the cases that come in via control link (as opposed to those coming through the 999 system) to determine the patient's condition. In Merseyside: A paramedic is based with the police in the Joint Command Centre.	Some data to suggest reduction in need for deployment of ambulance.
Joint Response Unit (JRU)	A London Ambulance Service fast response vehicle with one paramedic responds solely to police requests for medical assistance (except Red 1 calls). JRU aims to provide on-scene triage, assessment, and treatment of patients. Piloted in Hackney in 2011, it has subsequently been rolled out in 12 London boroughs.	79.3% of JRU attendances did not require a full ambulance deployment.
PCSOs employed as RDS Firefighters (Pilot)	Not relevant to review	N/A
Rural Intervention Vehicles (RIVs)	In March 2014, a jointly crewed fire/police response vehicle (operated by a police constable and a watch manager) which would be responsible for providing greater visibility in rural areas and focus more broadly on community safety issues than just traditional areas of Police and Fire business. Two RIVs carried out a total of 315 local engagement activities, including school visits, recruitment events, home-fire safety checks, crime prevention, farm watch, and road watch engagement activities.	Public confidence in the emergency services and community safety said to have increased. RIVs quite often arrive at a scene faster than other resources and have been able to stand down other resources, before they arrive, meaning a reduction in fuel costs of larger appliances and road risk.
3) Shared estates and assets	Shared estates and assets facilitate closer dialogue between the services. Savings are generated through the removal of duplication of property costs, sharing utilities and the possibility of sale or re-sale of existing sites and properties. Costs are also reduced due to diminished travel time.	—
Shared HQ	Not relevant to review	N/A
Joint Vehicle Workshop	Not relevant to review	N/A
Shared Training Centre	Not relevant to review	N/A
Tri-Service Hub	Not relevant to review	N/A
Joint Facilities	Not relevant to review	N/A
Dynamic Activation Posts (DAPs)	The aim of dynamic deployment is to increase patient care and response times through the placement of resources in areas of predicted high demand. DAPs help ensure that East of England Ambulance Service (EEAS) meets its target of reaching 75% of all life-threatening emergencies within 8 minutes.	Faster response times to emergency calls are reported to be one of the benefits.
FUTURE: Fleet Procurement	Not relevant to review	N/A
4) Joint Control Rooms	Joint control rooms provide great opportunities for increased collaboration and closer working which can enable faster and more effective responses to incidents (e.g., advanced/senior paramedics work in Police Command Centres [specifically, in times of exceptional demand]).	Reported improvements in reducing demand on both police and conveying ambulance resources. Collaboration described as hugely beneficial in understanding “each other’s” needs in terms of information requirements, risk assessments and incident prioritization.
5) Wider collaboration		—
Community Engagement	Collaboration between the services on community projects is well developed. Current projects involve community engagement with young people and families, addressing housing issues and developing civil contingency units.	Little to no data or evaluations of these.

Focus of Collaborative Activity	Summary of Activity	Outcomes
Housing	Not relevant to review	N/A
Local Resilience Forums	Not relevant to review	N/A
6) Strategic alliances and partnerships		—
Information Sharing	Not relevant to review	N/A
Community Safety – Operation Insight	Not relevant to review	N/A
Information Sharing Protocol and Operational Learning	Not relevant to review	N/A
Embedded Fire Officer into the Northwest Counter Terrorism Unit and Civil Contingencies Resilience Unit	Not relevant to review	N/A

EFR = emergency first responder; CFR = community first responder; PCSO = community support officer; AEDs = automated external defibrillators; EMR = emergency medical responder; JRU = joint response unit; RDS = retained firefighter; RIV = rural intervention vehicle; DAPs = dynamic activation posts; N/A = not applicable.

*Table reproduced from the authors’ report with permission from Scottish Institute for Policing Research (Dougall et al., 2023).

TABLE III Critical appraisal using the ArRoWS tool

Questions	Elias et al., 2021	Bronsky et al., 2017
1. Is the research question or objective(s) clear?	Yes	Yes
2. Is the study sample representative of its target population?	Yes. Included all referrals to the service during a defined period	No. Those with missing outcome information were excluded
3. Has a sample size, power calculation or measure of uncertainty (e.g., confidence intervals, standard errors) been provided?	No. Descriptive data only	Yes. Sample sizes and confidence intervals were reported
4. Are the exposure measures clearly defined and appropriate?	Yes	Yes
5. Is/are the outcome(s) clearly defined and appropriate?	Yes	Yes
6. Are confounders clearly defined and appropriate?	No clear consideration of any	Patients were their own controls
7. Are the statistical analyses clearly defined and appropriate?	No statistical analyses	Yes
8. Are the limitations of the study defined and appropriate?	Some appropriate limitations discussed	Some appropriate limitations discussed
9. Have the authors drawn appropriate conclusions from their results?	Conclusions are not overstated	Conclusion may overstate given methodological weaknesses

The third and final included report was The Emergency Services Collaboration Working Group (2016), which provided examples of collaborative projects, plans, and initiatives from across England and Wales. There was some limited evidence regarding initiatives involving collaboration (see Table II):

- **First response and co-responding** initiatives around emergency response to cardiac arrest with various collaboration models showing some evidence of reported improved response times, survival rates and cost-savings. Two further promising initiatives were Community Safety Responders (CSRs) performing combined police, fire, and emergency medical responder roles, and a

Telecare Response Service that supported people to live independently at home. No outcomes were reported.

- **Demand management and rationalization** included clinical support triaging calls, with some outcomes suggesting a reduction in need for deployment of ambulances. A joint response unit (JRU), which was a London Ambulance Service fast response vehicle with a single paramedic that responded solely to police requests for medical assistance suggested that 79% of attendances did not require full ambulance deployment. Jointly crewed Fire/Police response vehicles in rural areas focussed on community safety and local engagement activities suggested that public confidence and safety increased and arrival on scene was faster, enabling other

resources to stand down with cost savings and reduced road risk.

- **Shared estates and assets** included an intervention termed “dynamic deployment” that aimed to increase patient care and response times through resources being placed in areas of predicted high demand to help emergency services reach 75% of all life-threatening emergencies within 8 minutes. Faster response times to emergency calls were reported as beneficial. No other initiatives relevant to the review were reported under this heading.
- **Joint control rooms** for increased collaboration (e.g., advanced/senior paramedics worked in Police Command Centres) reported improvements in reducing demand on both police and conveying ambulance resources. Collaboration was described as hugely beneficial in understanding respective needs for information requirements, risk assessments and incident prioritization. No evaluations were provided.
- **Wider collaboration** between services on community projects was described as well-developed, involving community engagement with young people and families, addressing housing issues and developing civil contingency units. No evaluations were provided.
- **Strategic alliances and partnerships** encompassed themes of information sharing, community safety, operational learning and embedding fire officers in different units but did not provide information relevant to this review.

Results of Syntheses, Reporting Biases, and Evidence Certainty

The information retained from the grey literature was scant, and meaningful syntheses or assessments of evidence certainty were unfeasible.

DISCUSSION

Main Findings

Our review provided no peer reviewed empirical literature regarding collaboration between blue-light services with the specific intent to improve community safety and well-being. We could not provide any syntheses addressing the review objectives (i.e., there was no evidence in support of reducing social or health inequalities, or of methodologies or frameworks to deliver collaborative benefits, or cost-effective use of resources).

It was apparent from the grey literature retrieved that, in rare instances where blue-light services have formally collaborated and provided outcome data, the outcomes fell under one or more of the following: accessing services; emergency service usage and deployment (ambulances); ED usage and hospital admission; response times and survival rates; and public confidence. There were, in general, reported reductions in resource use and improved survival rates associated with increased efficiencies, and presumably reduced costs. This was accompanied by suggested improvements in public confidence in emergency services and increased community safety.

Although in the United Kingdom, the Policing and Crime Act 2017 (Policing and Crime Act 2017), the Crime and Disorder Act 1998 (Crime and Disorder Act 1998), and the policing prin-

ciples of the Police and Fire Reform (Scotland) Act 2012 (Police and Fire Reform (Scotland) Act 2012) place a statutory duty on Police, Fire and Ambulance Services to consider collaboration to deliver efficiency, effectiveness, and/or better outcomes for communities, we found a distinct lack of evidence in support of these collaborations. However, it is possible that there are ongoing collaborations that have not reported findings, or are yet to report, and it may be worth updating this review in 5 years. One such initiative are the UK multi-agency safeguarding hubs (MASH) intended to be effective multi-agency partnerships addressing the lack of information sharing between agencies, and preventing unnecessary exposure of people with vulnerability to harmful situations (Multi-agency working and information sharing-project: Final report, 2014). Evaluations of these initiatives did not appear in our search for evidence, and it is likely that the multi-agency approach includes blue-light services but not with bi- or tri-partite related outcomes—one notable example did mention fire and police included as multi-agencies. However, the outcomes were not bi-partite and did not meet our inclusion criteria (Shorrock et al., 2020).

Alongside this review, SIPR also funded a case study evaluation of cross-service collaboration using a community hub model, providing further evidence of cross-service collaboration (Dougall et al., 2023). The SIPR-funded case study was commissioned by the RCG in Scotland and illustrates the progressive approach in recognizing the value of evidence for collaborative partnership working and leadership (Docherty & Russell, 2022).

A previous review of research into emergency services collaboration by Parry and colleagues in 2015 noted that “most of the academic literature tends to focus on major incidents, small case studies or responding to major incidents” (Parry et al., 2015, p. 4). Our review found a substantial evidence gap of peer reviewed empirical literature regarding collaboration between blue-light services designed to improve community safety and well-being. Very little evidence appears to have been reported (or be available) regarding evaluations of collaborative initiatives in this area.

Limitations

Our search terms aimed to find evidence for blue-light collaboration to improve community safety and well-being or reduce inequalities. The search terms were not designed to capture emergency and disaster responses, where it is likely that much more literature is available for collaborative blue-light responses, and it is possible that community prevention activities were not the focus but included as secondary outcomes and missed in this review. It is also possible that the broader emergency management literature beyond blue-light response to other agencies also contained relevant evidence and should be considered in future research. Another possible limitation is that blue-light services may be in possession of consultancy reports for internal use only, embargoed for a variety of reasons and unavailable to researchers to identify. However, we did ask our steering group blue-light service representatives to identify and produce any relevant such reports, and none were forthcoming because they did not exist. Relevant items may also have been missed due to inconsistent terminology between reports, contributing to the sparse documentation retrieved, the language limited to English

only due to budget constraints, and being published prior to January 2012. Finally, we did not register the review protocol in advance of the review, and this would have improved the rigour by pre-specifying our stated aims.

Implications for Practice, Policy, and Research

Future literature reviews should focus on broader collaboration work involving other agencies beyond blue-light services (e.g., multi-agency safeguarding hub (MASH) initiatives) (Shorrocks et al., 2020) or specific topic examples that may inform future collaboration (e.g., police carriage of naloxone) (Speakman et al., 2023). There is a real need for blue-light service collaborations to go beyond internal reviews of effectiveness of collaborations and, where possible, document and publish outcomes stemming from these collaborations to provide high-quality evidence of potentially effective collaboration. Ideally these collaborations should be independently evaluated and published in academic journals to inform future evidence-based initiatives.

CONCLUSION

To our knowledge, this is the first review to summarize blue-light service collaborations to improve community safety and well-being. Although this review only retrieved three reports, the scant evidence uncovered suggests that service collaboration initiatives have potential for decreased resource use across services, increased public confidence, faster responses, increased survival rates, and reduced risks associated with unnecessary emergency responses from other services. In future, blue-light services should consider these preliminary findings and focus more on problem-solving initiatives for improving communities' safety and well-being to ascertain whether any of these associated public health and service benefits are realized. In order to demonstrate impact and inform evidence-based approaches to blue-light collaboration, it is imperative that such collaborative work be independently evaluated to provide robust evidence of what works to influence policy and practice nationally and internationally.

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CONFLICT OF INTEREST DISCLOSURE

The authors declare that there are no conflicts of interest.

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SUPPLEMENTAL MATERIAL

Supplemental information for this article is available online at journalcswb.ca/index.php/cswb/article/view/319/supp_material:

- Supplemental Table S1

REFERENCES

- Bronsky, E. S., McGraw, C., Johnson, R., Giordano, K., Orlando, A., & Bar-Or, D. (2017). CARES: A community-wide collaboration identifies super-utilizers and reduces their 9-1-1 call, emergency department, and hospital visit rates. *Prehospital Emergency Care*, 21(6), 693–699. <https://doi.org/10.1080/10903127.2017.1335820>
- Christie Commission on the Future Delivery of Public Services. (2011). Retrieved 3 March 2023 from <http://www.gov.scot/publications/commission-future-delivery-public-services/>
- Coles, B., Tyrer, F., Hussein, H., Dhalwani, N., & Khunti, K. (2021). Development, content validation, and reliability of the Assessment of Real-World Observational Studies (ArRoWS) critical appraisal tool. *Annals of Epidemiology*, 55, 57–63.e15. <https://doi.org/10.1016/j.annepidem.2020.09.014>
- Crime and Disorder Act 1998*. Retrieved 3 May 2023 from <https://www.legislation.gov.uk/ukpga/1998/37/contents>
- Docherty, D. K., & Russell, B. (2022). *Police Scotland and local government collaborative leadership pilots* (Research Report No.1). Scottish Institute for Policing Research. <https://www.sipr.ac.uk/wp-content/uploads/2022/06/Police-Scotland-and-Local-Government-Collaborative-Leadership-Pilots-Evaluation-Docherty-and-Russell.pdf>
- Dougall, N., Heyman, I., Tatnell, A., Wooff, A., & MacGillivray, S. (2023). *How cross-service collaboration between ambulance, fire, and policing services can improve community safety and wellbeing: A systematic review and case study of an area experiencing significant disadvantage*. [Final report]. Scottish Institute for Policing Research. <https://www.sipr.ac.uk/wp-content/uploads/2023/01/Project-Report-Final-version-26012023.pdf>
- Elias, L., Maiden, G., Manger, J., & Reyes, P. (2021). Teaming up for more comprehensive care: Case study of the Geriatric flying squad and emergency responders (ambulance, police, fire and rescue). *Journal of Integrated Care*, 29(4), 377–389. <https://doi.org/10.1108/JICA-05-2021-0025>
- Emergency Services Collaboration Working Group. *National overview*. (2016). <https://www.apccs.police.uk/media/1114/emergency-service-collaboration-working-group-national-overview-2016.pdf>
- Multi-agency working and information-sharing project: Final report*. (2014). Home Office.
- O'Neill, M., & McCarthy, D. J. (2014). (Re)negotiating police culture through partnership working: Trust, compromise and the 'new' pragmatism. *Criminology & Criminal Justice*, 14(2), 143–159. <https://doi.org/10.1177/1748895812469381>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>
- Parry, J., Kane, E., Martin, D., & Bandyopadhyay, S. (2015). *Research into emergency services collaboration*. Skills for Justice. <https://www.sfjuk.com/images/research-reports/2015-2016/ESC-report-2015.pdf>
- Police and Fire Reform (Scotland) Act 2012*. Queen's Printer for Scotland. Retrieved 14 March 2023 from <https://www.legislation.gov.uk/asp/2012/8/section/32/enacted>
- Policing and Crime Act 2017*. Queen's Printer of Acts of Parliament. Retrieved 3 March 2023 from <https://www.legislation.gov.uk/ukpga/2017/3/contents/enacted/data.htm>
- Rummery, K. (2009). Healthy partnerships, healthy citizens? An international review of partnerships in health and social care and patient/user outcomes. *Part Special Issue: New Approaches to Researching*

Patient Safety, 69(12), 1797–1804. <https://doi.org/10.1016/j.socscimed.2009.09.004>

Scottish Emergency Services National Collaboration Strategy. (2018). Scottish Ambulance Service. <https://www.scottishambulance.com/media/hxwjlgti/scottishemergencyservices.pdf>

Scottish Institute for Policing Research. *Rapid Evidence Assessment Call: Tri-Service Collaboration*. (2021). SIPR. <https://www.sipr.ac.uk/projects/rapid-evidence-assessment-call-tri-service-collaboration/>

Shorrock, S., McManus, M. M., & Kirby, S. (2020). Practitioner perspectives of multi-agency safeguarding hubs (MASH). *The Journal of Adult*

Protection, 22(1), 9–20. <https://doi.org/10.1108/JAP-06-2019-0021>

Speakman, E. M., Hillen, P., Heyman, I., Murray, J., Dougall, N., Aston, E. V., & McAuley, A. (2023). 'I'm not going to leave someone to die': Carriage of naloxone by police in Scotland within a public health framework: A qualitative study of acceptability and experiences. *Harm Reduction Journal*, 20(1), 20. <https://doi.org/10.1186/s12954-023-00750-9>

Strudwick, K., Johnson, L., & Dyer, P. (2022). Collaborative working and building partnership: Bringing the two worlds together. *The Police Journal*, 0032258X221128406. <https://doi.org/10.1177/0032258X221128406>