EVIDENCE-BASED POLICING IN SERBIA – EVALUATING DETERRENT EFFECTS OF FOOT PATROL IN ONE HOT SPOT OF CRIME

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Introduction

Crime tends to concentrate in space and time (Weisburd, 2015). Accordingly, police try to focus their resources. This kind of place-based approach is called hot spot policing (HSP), which focuses on hot spots of crime. Reiss (1985) defined a hot spot as a small cluster of addresses with frequent "hard" crime calls (such as burglary, shootings, thefts, assaults, rapes) and/or "soft" crime calls (break-in alarms, disturbances, noise, vandalism, fights, petty thefts, etc.). Policing the crime hot spots has been criticised as uninfluential to crime levels, for crime dispersion in the nearby areas, and unjust towards particular groups or disadvantaged neighbourhoods. However, police patrolling and, thus, HSP still present one of the major strategies of policing where much of the resources have been deployed.

The pioneering study of police patrolling was the experiment in Kansas City by Kelling et al. (1974). It found no difference between proactive, reactive, and controlled areas. However, studies later discovered the positive effects of patrolling high-crime areas. Sherman and Weisburd (1995) have found a reduction of calls for service from 6 to 13 per cent due to the policing of 110 hot spots in Minneapolis (USA). Afterwards, many studies evaluated HSP, some of which found significant crime reductions: England (Basford, Sims, Agar, Harinam & Strang, 2021; Bland, Leggetter, Cestaro & Sebire, 2021), USA (Caplan, Kennedy, Drawve & Baughman, 2021; Ratcliffe, Taniguchi, Groff & Wood, 2011; Weisburd, Telep, Vovak, Zastrow, Braga, Turchan and Rosenfeld, 2022), Canada (Andresen and Malleson, 2014), Sweden (Gerell, 2016), Australia (Barnes, et al., 2020). Besides, it has been found that police presence in high-crime areas benefits their neighbourhoods (Bowers, et al., 2011; Braga, Papachristos and Hureau, 2012).

A significant part of crime prevention comes from the preventive patrolling of the police, which should deter those who may act unlawfully. Since crime tends to concentrate in space and time (Weisburd, 2015), it is expected that police follow this rule. However, this may not always be the case, and everyday police activities such as patrolling may rely on past experiences and instincts. On the other hand, evidence-based policing is a principle which considers a scientific approach. Sherman (2013) defines it as a decision-making method about "what works" in policing, meaning which practices and strategies accomplish police missions most cost-effectively. It contrasts the decision-making process based on assumptions, traditions, conventions, or theory because it allows continuous impact assessment of the policing using empirical research findings (Sherman, 2013).

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Purpose

Considering the above, this study has two main objectives. The first one is to promote evidence-based policing and thus improve policing in general. By adopting practices of evaluation and continuous impact assessment using scientific principles, employment of resources should be enhanced (e.g., cost-benefit analysis), crime reduction should be achieved, police relations with the public should be improved, and job satisfaction among police officers should be higher. Therefore, current research evaluates the effects of a foot patrol in one crime hot spot to promote further studies in the field and adoption of these practices by police management in long-term strategic plans and short-term or everyday activities and scheduling.

Secondly, this study aims to evaluate the effects of foot patrol on crime in one hot spot. As discussed, previous research has shown that police presence deters from committing a crime and reduces crime levels in space and time. However, it has mostly been done in the West (USA, United Kingdom, Australia, and Western Europe), and there seems to be a lack of similar evaluations in the Balkan region. Furthermore, different contexts in Southeastern Europe, considering culture, socioeconomic conditions, urbanism, policing and police-citizen relations, may provide different outcomes of hot spot policing.

Hypotheses for the research were developed considering previous evidence. Firstly, this study will test the deterrent effects of police presence on street visible crimes and disorder. Secondly, it will test if the patrol presence results in a residual crime effect considering the time after the patrol was in the hot spot. Sherman (2022c) proposes that hot spot policing has cumulative and residual deterrence effects on crime. Cumulative deterrence has been found by Bland et al. (2021) when the fifteen minutes per day patrol reduced public place violent crime for each additional consecutive day, with the largest differences after the third day. However, the current study's design and available data from police practices did not provide enough information to investigate this hypothesis. Instead, it has been tested to see if patrol presence in a hot spot has had any residual effects on crime for the rest of the day.

Considering the context-specific characteristics and policing in Serbia, the research questions (RQ) this study could answer were formulated as follows:

RQ 1: How does police presence in a hot spot of crime and call for service influence their levels (by reducing or increasing registered incidents)?

RQ 2: Does the police presence in a hot spot of crime and call for service have a residual effect in time (has deterrence been achieved in some time after the foot patrol)?

The research questions have been answered through the evaluation of foot patrolling in one hot spot of crime in an urban city area for three months. Crime levels have been examined by considering all recorded incidents by the police and dividing them into violence and public order incidents on the one hand and property-related incidents on the other.

General Crime Deterrent Effects of Hot Spot Policing

The objective of preventive patrolling is to deter those who would behave unlawfully or delinquently from doing so. Preventive patrolling is thus mostly performed by police visibility in public, where and when those who consider doing some criminal or delinquent acts would be deterred. This kind of policing aims to be visible to potential criminals or delinquents, which is mainly achieved by police uniforms and marked police vehicles. Thus, foot patrols or vehicle patrols may perform patrolling, and it

is assumed that both would result in crime prevention benefits. According to the knowledge of crime concentration in space (see Law on Crime Concentration in Weisburd, 2015), preventive patrolling is thus focused on high-crime areas or risky places at specific times.

In the systematic review by Braga et al. (2019), it is found that 62 of the 78 hot spot policing studies reported noteworthy crime and disorder reductions. This review also found crime prevention benefits to surrounding areas when accounting for displacement and diffusion effects of hot spot policing. The recent systematic review on the effectiveness of police presence (Dau, Vandeviver, Dewinter, Witlox & Vander Beken, 2023) finds that it mainly reduces motor theft, property, violence, and gun crimes. Moreover, findings derived from 49 studies showed that it reduces calls for service and improves traffic behaviour. However, evidence on the effects of hot spot policing has not always been so straightforward.

The Kansas City Experiment, published by the American Police Foundation (Kelling, Pate, Dieckman, and Brown, 1974), conducted during one-year period 1972–1973, with settling "reactive" patrol areas which received police only after a call for assistance, proactive patrol with increased police visibility and control patrol areas with a normal level of patrolling maintained. Analysis revealed that three areas experienced no significant differences in the level of crime, followed by citizens' attitudes toward police services, citizens' fear of crime, police response time, or citizens' satisfaction with police response time. Although Kelling et al. (1974) did not call for less policing but for better allocation of resources, further research and implementation of proactive policing within high-crime areas have mostly been discouraged by this research.

The results of the Kansas City Experiment have been contested by later studies of hot spots and geographically focused initiatives in policing. Sherman and Weisburd (1995) criticised the Kansas City Experiment for the design's substantial statistical, measurement, and conceptual problems. Sherman and Weisburd (1995), building on previous research findings that crime concentrates in a few places, proposed that patrolling should also be focused on small areas, not diluted to larger patrol beats. They conducted a randomised controlled trial in 110 crime hot spots in Minneapolis, reducing calls for service from 6 to 13 per cent and positively affecting a disorder. Afterwards, many randomised controlled trials found positive effects of police presence on crime reduction (see studies in Braga, Papachristos, and Hureau, 2012).

A few studies on foot patrols confirmed their efficiency in crime and disorder reduction. One of the most influential, the foot patrol experiment in Philadelphia (Ratcliffe et al., 2011), found a significant reduction of violence due to targeted patrols in treatment areas. In recent trials, foot patrol experiments in England reduced violence (Basford et al., 2021; Bland et al., 2021). In Vancouver (Canada), Andresen and Malleson (2014) have also found a decrease in criminal activities in areas where foot patrols have been conducted. Alternative to foot patrolling wider areas, focused patrol visits to businesses identified as hot spots (crime attractors and generators) reduced violence by more than 20% in the USA (Caplan et al., 2021).

Evidence supports the crime reduction effects of foot patrols even in the neighbouring areas and the lack of crime displacement. A systematic review found that geographically focused policing initiatives were associated with significant reductions in crime and disorder in targeted and nearby areas (Bowers et al., 2011). Therefore, critics that hot spot policing has a dispersive crime effect, that it makes crimes "just move around the corner", have been contested.

Although much of the recent research finds that hot spot policing has been effective in crime prevention, one study finds that this may not be so straightforward in unusual circumstances such as COVID-19

pandemics or the post-George Floyd murder atmosphere in the USA (Taylor et al., 2022). Therefore, specific tactics for policing hot spots and high crime areas should be further studied and developed.

Recent studies have also found that hot spot policing strategies may improve citizens' safety and perceptions towards the police. For example, in a multicity randomised trial in the USA, police officers received procedural justice training (Weisburd et al., 2022). This led to increased knowledge about procedural justice and more procedurally just behaviour by the officers on the field. Alongside, these police officers made fewer arrests, and residents of those areas where they patrolled were significantly less likely to perceive police as harassing or using unnecessary force. This study has also found a reduction of 14% in crime incidents in the hot spots where patrolled assigned police officers who received procedural justice training (Weisburd et al., 2022). Therefore, criticism of hot spot policing and other geographically focused strategies (on places, neighbourhoods, etc.) may be contested by developing practices that secure equal justice and community- or citizen-oriented services according to their needs. However, the current study was limited in the resources to include aspects of citizen perceptions of policing in the hot spot.

Spatio-Temporal Crime Analyses in Serbia and a Necessity for Evidence-Based Policing

Although crime mapping and spatiotemporal analyses of crime have been rare in Serbia and the region, some studies still use geographical approaches to crime. Milić (2015) geocoded armed robberies recorded by one police station in Belgrade and analysed their density according to the security sectors – geographical areas determined by the Serbian police as significant unities due to which police resources should be assigned. He found that one-third of the robberies were concentrated in one out of twelve security sectors and proposed further analysis to investigate if the human resources were allocated according to this distribution. Milić (p. 111, 2015) also found that only three of 156 locations were responsible for 13% of crimes and identified "top 6" locations (three sporting bets, one post office, one bank, and a casino) for resource allocation as a problem-oriented approach that should lead to a crime reduction of 23%. In 2019, Milojković and Petrović mapped armed robberies in Zrenjanin from 2008 to 2019, distinguishing three hot spots and identifying their characteristics, such as the weekday and hour of occurrence, or victimisation of persons and targeting businesses.

Besides studies on hot spots of crime, there have been some studies on the spatial distribution of crime. Baić and Kolarević (2015) analysed the whole territory of Serbia for the criminal offence of rape from 2006 to 2012. They found some differences in the spatial distribution among the regions. However, rates of rapes per 100,000 population were equally distributed to these regions. On the other hand, they found that most rapes were committed in the summer, during the mid-week, from 6 PM to 12 PM. Considering the spatial distribution of crime on a lower level, Stanković (2022) confirmed that crime in Serbian urban city area (Niš) has been concentrated at levels similar to those found in the rest of Europe and worldwide (Andresen & Malleson, 2011; Vandeviver & Steenbeek, 2019; Weisburd, 2015). This study found that, depending on the level of analysis (grid cells of 100x100, 500x500, and 1000x1000 metres), 50 per cent of both property and violent crime have been committed in approximately 0.3 (100x100m) to 8.9 (1000x1000m) per cent of all cells. Using the Spatial point pattern test, it has been found that spatial patterns have been stable throughout the study period – during 2008, 2013, and 2018 (Stanković, 2022).

Some studies have identified hot spots of crime, spatial distribution, and crime concentration in Serbia. However, no research in the region seems to evaluate the effects of the geographically focused initiatives

of policing micro places such as hot spots. Furthermore, the effects of policing, in general, have been an understudied topic, and bringing an evidence-based approach to practical policing work would close this gap. Only by adopting evidence-based approaches and bringing science into practice could we know if policing works and how it works. This should be applied to every aspect of it: in creating crime prevention strategies, conducting crime investigations, or dealing with traffic issues. It could be applied in day-to-day work (to evaluate patrolling, as in the current study) or on a longer scale (for example, to evaluate if a training in domestic violence for police officers has contributed to their practices).

Design and Methods

Data

This study uses data on crime and disorder incidents recorded by the police (mostly called in literature as *calls for service*) at the permanent hot spot of crime in an urban city area in Serbia (hereafter hot spot).[2] Besides these incidents, the data includes dates and times of police foot patrols conducted in this hot spot. The area is partly residential but mostly business, consisting of a central bus station, shops and stores, and an open market. In addition, on the edges is a tourist attraction and promenade, all in a range of less than half of the square kilometre. Since police managers have recognised this area as a permanent hot spot of crime and disorder in recent decades, shift-length foot patrols have been assigned accordingly.

Foot patrolling in a hot spot comprises general police duties: prevention-oriented activities such as high visibility, communication with the citizens and gathering intelligence information, responding to calls and reported events, or proactivity such as stop and search. Usually, a police officer would spend the whole shift in the hot spot, except when they would be deployed from the hot spot to some other tasks due to the lack of human resources.[3] In the hot spot area, they move from one spot to another by visiting the open market, bus station, or businesses and making their visibility on the street. They were unaware of this study evaluation because the research started afterwards, so it could not influence their working routine and results. Shift-length foot patrol is usually 8 hours long. About five to six hours would be spent in the hot spot, while the rest is spent in the office doing administrative work if not deployed on other tasks.

In addition to the spatial concentration of crime and disorder incidents, there are some temporal considerations. Most of the incidents happen in the first part of the day, when the area is crowded by the open market, shop customers, and bus passengers. These would include property-related offences, like pickpocketing, thefts or frauds, and violent incidents, like assaults or fights, as well as public order violations. However, some incidents have been reported in later hours since the area includes a few casinos and, at the edges, a few bars and a park. In addition, a socio-economically disadvantaged residential area is nearby, and residents come to a hot spot for shopping, business, or leisure. Therefore, except for the ambient population (temporal residents), permanent residents have often been involved in the incidents. For these reasons, it has been valuable to consider foot patrol influence at any time of the day.

2 Further information is undisclosed for data confidentiality reasons of the police organization. The information on the data is available for sharing upon a reasonable request.

3 Information on these cases has not been available. However, even if during some of the foot patrol days, officers have been deployed to other tasks, they would usually have spent at least some time in the hot spot. Even if other tasks would take a few hours, a foot patrol shift at the hot spot lasts 8 hours. Therefore, it has been hypothesised that even if police officers have been assigned to some other tasks, they have spent at least some time of the day in the hot spot, doing initial crime prevention tasks.

Organisational resources usually do not allow police managers to assign officers for 24 hours a day in this hot spot.[4] Most commonly, one police officer would do a foot patrol shift in the first part of the day, from 7 a.m. to 3 p.m.. This is the time of the day when open market and retail stores are open; thus, the ambient population and mobility in the area are high. It can be during both working days or weekends because mobility is sometimes heightened during the weekend days when people used to shop or travel. Criminological research also suggests that this time of the day is the most common for criminal offending. For example, Sherman and Weisburd (1995) have found that around 50 per cent of all crime calls were between 7 a.m. and 3 p.m. Other examples of the foot patrol shift may be from 10 a.m. to 6 p.m. or 12-8 p.m. if some afternoon events in the area attract the attention of the police (e.g., public gatherings). The period for the analysis was three months in 2022: August, September, and October.

Analytical Strategy

The data was collected in Microsoft Excel and analysed using statistical and geographical methods in the R programming language. Firstly, all the recorded incidents within the police station during September were geocoded using the address of the incident in the GIS software – Google Earth. Spatial statistics have been conducted to determine the hot spot areas of the incidents registered within the police station. Then, hexagonal bins were laid on the map to make hot spots – show areas with clusters of events (Kaplan, 2023).[5] This confirmed that the geographical area to which foot patrols were assigned is indeed a hot spot for incidents registered by the police. In Figure 1, it could be seen as the bin filled with the darkest, orange-red colour, with more than ten incidents registered in September.

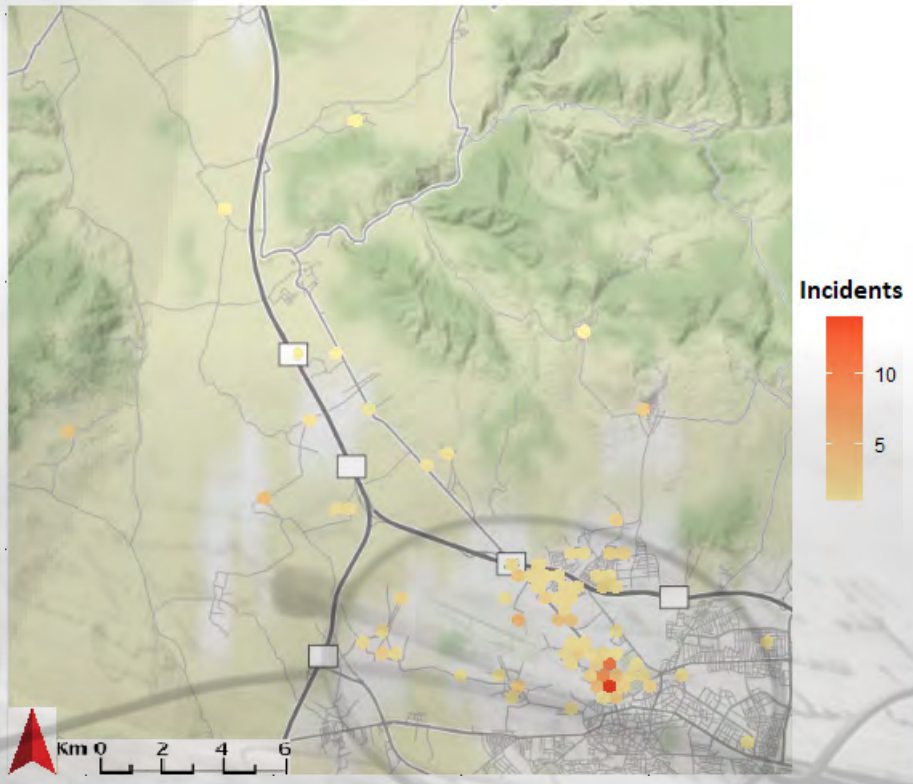

Figure 1 *Map of the Reported Incidents in September 2022*

4 Neither author implies that it would be the best solution.

5 More about this method and procedure to perform in the chapter *IV Visualize* in Kaplan (2023). *Crime by the Numbers: A Criminologists's Guide to R.* Available at: https://crimebythenumbers.com/

So far, evaluations of HSP have primarily been performed by using parallel track trials where patrols have been assigned to the experimental areas while those who were not patrolled served as control areas, and results between them would have been compared. Instead, this research uses the premise of the "repeat crossover" design of HSP, where each hot spot serves as its own control. Sherman (2022c) explains that "using each day in each hot spot as the unit of analysis (hot spot-days), each hot spot is randomly assigned to different treatments on different days. Crime outcomes on treatment days, on average, in each hot spot are then compared to average outcomes on no-treatment days, within each hot spot." However, this study analysed only one hot spot and compared treatment units (foot patrol conducted) with no-treatment units (no foot patrol). Therefore, it has limitations addressed in the conclusions.

Table 1 *Summary of Incidents and Police Foot Patrols in the Hot Spot During the Study Period*

	Units	Count	Mean	Max	Min
Incidents	92	78	0.85	4	0
Foot patrols	92	34	0.45	1	0
Inc. during FP	34	15	0.47	2	0
Inc. on FP day	34	27	0.79	4	0
Inc. no FP day	58	50	0.88	4	0
Inc. no FP (7-15h)	58	27	0.47	2	0
Inc. no FP (any time)	92	63	0.67	4	0
Inc. FP day no FP (15-07h)	34	13	0.38	2	0
Inc. no FP day FP (15-07h)	58	23	0.40	3	0
Violence (and public order) incidents	92	42	0.46	2	0
Viol. inc. during FP	34	8	0.23	1	0
Viol. inc. on FP day	34	18	0.53	2	0
Viol. inc. no FP day	58	25	0.43	2	0
Viol. inc. no FP day (7-15h)	58	14	0.24	2	0
Viol. inc. no FP (any time)	92	35	0.38	2	0
Viol. inc. FP day no FP (15-07h)	34	14	0.29	2	0
Viol. inc. no FP day (15-07h)	58	10	0.17	3	0
Property-related incidents	92	41	0.43	2	0
Prop. inc. during FP	34	9	0.26	2	0
Prop. inc. on FP day	34	13	0.38	2	0
Prop. inc. no FP day	58	28	0.48	2	0
Prop. inc. no FP day (7-15h)	58	19	0.33	2	0
Prop. inc. no FP (any time)	92	32	0.35	2	0
Prop. inc. FP day no FP (15-07h)	34	4	0.12	1	0
Prop. inc. no FP day (15-07h)	58	9	0.15	2	0

Table 1 summarises all the incidents and foot patrols conducted in the hot spot during the study period. In three months, there were 92 days during which 78 incidents occurred in the studied hot spot, making an average of 0.85 incidents per day. The maximum number of incidents recorded per day is

4, while there were 43 days without any recorded incidents. Foot patrols were conducted in 34 of the 92 days. Crime levels have been examined using all the registered incidents, violence and public order incidents, and property-related incidents (Table 1). Violence and public order were merged since these incidents comprise violence-related events like verbal and physical assaults, fights, bodily injuries, noise, and uproar. Depending on context-specific differences, these events can be qualified by prosecution as criminal or minor offences (misdemeanour). Therefore, these incidents have been merged into one category. The distribution among the incidents was almost the same: 42 incidents violence (and public order) and 41 property-related incidents. This makes 83, five higher than all registered incidents, which is unlikely. This is because we used five cases of robbery in both sets. After all, these cases have elements of both types of crime. They are motivated by gaining some property (money or goods), but perpetrators have used some form of violence (threat, physical force, or a weapon) to acquire it.

Units (groups or samples) of interest for the analysis were defined as (Table 1):

1. Incidents recorded during the foot patrol (*Inc. during FP*);
2. Incidents recorded during the day when there was a foot patrol (*Inc. on FP day*);
3. Incidents recorded during days without foot patrol (*Inc. no FP day*);
4. Incidents recorded during the days without a foot patrol, but at the usual time of foot patrolling (*Inc. no FP day, 7-15h*);
5. Incidents recorded at the time when there was no foot patrol (*Inc. no FP, any time*);
6. Incidents recorded on a foot patrol day when there was no foot patrol (Inc. FP day no FP, 15-07h);
7. Incidents recorded on the no foot patrol day and at the uncommon foot patrol time (Inc. no FP day, 15-07h).

Two-sided t-tests have been performed to check differences in means between different units (groups or samples).

Results

All the Incidents

During those 34 foot patrols conducted in a hot spot, 15 incidents occurred (mean 0.44), with a maximum of 2 incidents recorded during the shift. On the other hand, when there was no foot patrol (any time), there were 63 recorded incidents out of 92 days (mean 0.69). The unit here is 92 because even in those days when a foot patrol was conducted, incidents could occur in the other 16 hours of the day. Table 2 (Inc. during FP ~ Inc. no FP, any time) shows the difference in means between these two groups is 30 per cent (reduction in recorded incidents when foot patrol is present). However, the result of a t-test is non-significant (p=0.133).

The same has been observed when comparing the means of the incidents on foot patrol days (0.79) and days without foot patrols (0.88). 11 per cent of incidents occurred less on the days when a foot patrol was conducted. However, the results of the test are insignificant (p=0.677). The 6.4 per cent non-significant decrease in means has also been found between the time when foot patrol was conducted and the same time (7-15h) of the no-patrol days (p=0.532). When considering the time of the day when there is usually no foot patrol (15-7h), foot patrol days have experienced 5 per cent fewer incidents than no foot patrol days in those periods. However, the results of the t-test are statistically non-significant (p=0.869).

Table 2 *T-Test Results for the Treatment and No-Treatment Units Considering All the Incidents*

	Mean	Difference %	Significance	CI
Inc. during FP ~ Inc. no FP (any time)		-30%	0.133	-0.58 - 0.07
Inc. during FP	0.47			
Inc. when no FP (any time)	0.67			
Inc. on FP day ~ Inc. no FP day		-11%	0.683	-0.49 - 0.32
Inc. on FP day	0.79			
Inc. no FP day	0.88			
Inc. during FP ~ Inc. no FP (7-15h)		-6.4%	0.799	-0.28 - 0.22
Inc. during FP	0.44			
Inc. no FP (7-15h)	0.47			
Inc. FP day no FP ~ Inc. no FP day (15-7h)		-5%	0.869	-0.28 - 0.23
Inc. FP day no FP	0.38			
Inc. no FP day (15-7h)	0.40			

Violence and property-related incidents

The results of the separate analyses considering property-related (Table 3) and violent incidents (Table 4) are mainly like those when accounting for all the recorded incidents. Differences in means when foot patrol is present and when this is not the case (any time) are greater for violent incidents (40%) than for property-related incidents (26%). However, t-test results show that these differences are non-significant. Similar to all the incidents, property crimes experienced a 21 per cent non-significant (p=0.458) reduction during the foot patrol days than during days without a foot patrol. On the contrary, 19 per cent more violence (and public order) incidents were registered during the foot patrol days, although statistically insignificant (p=0.478). Considering the time of the day when foot patrols are usually conducted, from 07 a.m. to 3 p.m. (7-15h in tables), foot patrol days experienced a 21 per cent insignificant reduction in property incidents, while violence and public order incidents experienced a 4 per cent reduction. Considering unusual foot patrol time (15 p.m. to 07 a.m.), property-related incidents experienced a 26 per cent non-significant (p=0.673) reduction during the foot patrol days, while violence and public order experienced an insignificant (p=0.28) increase of 70 per cent more incidents recorded after the foot patrol took place (after 3 p.m.).

Table 3 *T-Test Results for the Property-Related Incidents*

Property	Mean	Difference %	Significance	CI
Inc. during FP ~ Inc. no FP (any time)		-26%	0.452	-0.3 - 0.13
Inc. during FP	0.26			
Inc. when no FP (any time)	0.35			
Inc. on FP day ~ Inc. no FP day		-21%	0.458	-0.37 - 0.16
Inc. on FP day	0.38			
Inc. no FP day	0.48			
Inc. during FP ~ Inc. no FP (7-15h)		-21%	0.57	-0.28 - 0.15
Inc. during FP	0.26			
Inc. no FP (7-15h)	0.33			
Inc. FP day no FP ~ Inc. no FP day (15-07h)		-26%	0.673	-0.21 - 0.13
Inc. FP day no FP	0.11			
Inc. no FP day (15-07h)	0.15			

Table 4 *T-Test Results for the Violence and Public Order*

Violence (and public order)	Mean	Difference %	Significance	CI
Inc. during FP ~ Inc. no FP (any time)		-40%	0.215	-0.38 - 0.08
Inc. during FP	0.23			
Inc. when no FP (any time)	0.38			
Inc. on FP day ~ Inc. no FP day		19%	0.478	-0.18 - 0.37
Inc. on FP day	0.53			
Inc. no FP day	0.43			
Inc. during FP ~ Inc. no FP (7-15h)		-4%	0.94	-0.2 - 0.19
Inc. during FP	0.23			
Inc. no FP (7-15h)	0.24			
Inc. FP day no FP ~ Inc. no FP day (15-07h)		70%	0.28	-0.1 - 0.34
Inc. FP day no FP	0.29			
Inc. no FP day (15-07h)	0.17			

Discussion and Conclusions

Originality and Value

As Sherman (2022c) points out, repeat crossover design "opens the door for police to practice evidence-based policing by 'testing-as-you-go' for continuous impact assessment (CIA)". Indeed, the purpose of the current study was to encourage and simplify these evidence-based practices in policing. Furthermore, repeat crossover design gives equal attention to every hot spot rather than excluding hot spot policing from some areas during the experiment. Current research applied these principles to one hot spot using a simplified methodology and offers this approach to police management.

Although the results of the t-tests are non-significant, this research still provides some theoretical and practical implications. At all levels of measurement, registered incidents dropped when foot patrols were conducted. Firstly, results showed a decrease in all the recorded incidents, violence (and public order), and property-related incidents when there was a foot patrol, opposite to when there was no foot patrol. This is expected since previous evidence also suggests that police presence, specifically foot patrolling, deters crime and delinquency (Bashford et al., 2021; Bland et al. 2021; Dau et al. 2022; Ratcliffe et al. 2011).

However, the solution was never to put the police patrol all the time at every single hot spot. Therefore, the difference is observed in the days (units) when there was a shift-length foot patrol and without it. It has been hypothesised that foot patrol days would experience fewer crimes (recorded incidents). Insignificant reductions have been observed during the foot patrol days considering all the recorded incidents (11%) and property-related incidents (21%). However, violence and public order have been recorded more often during foot patrol days. It might be implied that police officers in the hot spot area have been able to observe and register more of these incidents, so the increase is due to their proactivity. However, further research should be conducted to investigate this claim broadly.

Since shift-length foot patrols have usually been conducted from 7 a.m. to 3 p.m., reductions have been observed in all types of registered incidents. Still, property-related incidents have experienced a greater difference in means (21%) than all the incidents (6.4%) and violent incidents (4%). It might be implied that foot patrol officers indeed deter property crimes at this time of the day, when crowded open markets, bus station, and retail stores create more opportunities for pickpocketing, which is considered by the police as the most common crime in this hot spot. This is when the police's guardianship role is achieved, although two other elements of the crime triangle, motivated offenders and suitable targets, are present (Cohen & Felson, 1979). However, the insignificant results of current evaluations require further research for the conclusions.

Finally, considering the time when foot patrol is unusual, from 3 p.m. to 7 a.m., there are statistically non-significant reductions in all the registered incidents (5%) and property-related incidents (26%), suggesting residual deterrent effects of police presence as proposed by Sherman, 2022c. On the other hand, considering violence and disorder, a prominent increase (70%) has been observed in the days after the shift-length foot patrols have been conducted, compared to non-foot patrol days, suggesting that police patrols may not have a residual deterrent effect on violent crimes and disorder. Again, new studies should provide more evidence on this.

Limitations and Call for Action

The study has not been able to answer a few common questions that should be addressed when evaluating hot spot policing. Firstly, it does not explore crime dispersion to the nearby areas for a few reasons. The studied hot spot (foot patrol area) is in the city centre, sharing the borders with another police station, where probably another foot patrol area has been assigned at the same time. However, information on the recorded incidents and foot patrol shifts has been unavailable, and no further information could contribute to the analysis. Previous knowledge claims that geographically focused police initiatives do not inevitably lead to the displacement of crime but rather are associated with crime-prevention benefits (Milić, 2012). Therefore, further research should investigate if police patrolling hot spot areas in Serbia and the region would result in similar crime prevention benefits, such as in other parts of the world (Braga et al., 1999).

The current study uses shift-length foot patrol data, while some other studies have found that a smaller time dosage, from 12 to 15 minutes, achieves similar results (Bland et al., 2021; Koper, 1995). If this dosage would be enough for crime reductions in another context, it would save great resources for the police. Furthermore, further studies should deal with what the police do in the hot spots and how different strategies affect crime and delinquency. Problem-oriented policing (Goldstein, 1979) has particularly been connected to and applied in hot spots. Research finds it a practical approach for place-based crime reduction (Braga et al., 1999). However, it may not always be effective in exceptional situations, as Taylor et al. (2022) found in the pandemics or after the murder of George Floyd. In addition, policing in Serbia and the Balkan region should be more context-specific than in the West, and thereby, some strategies may work differently.

Lastly, it would be valuable to explore citizens' perceptions and attitudes towards crime and policing when geographically focused initiatives take place, such as in Weisburd et al. (2022), since such public surveying has not been so typical in the region. This knowledge would also contribute to creating strategies around a police role in society since police organisations in the region have been engaged in the reform processes for the last few decades.

Indeed, opportunities and ideas for the research are inexhaustible. However, they depend on many factors, such as data availability, compliance and cooperability of research subjects and decision-makers. As previously said, this paper aimed towards promoting it. The results of this study might have been more prominent with a greater sample: more units (days and shifts of foot patrol) and more places (hot spots) and police presence information in those. However, data on these was unavailable. Therefore, further explorative and experimental studies on hot spots of crime and police presence would be favourable in creating more robust evidence of the police's crime prevention effects in the region.

This switch to an evidence-based approach would contribute to better use of resources and capacities. For example, suppose the evaluation of permanent foot patrolling in one geographical area shows no effect on crime levels and fear of crime or that it contributes to police-community relations. In that case, human resources should be deployed to some other place. Ultimately, this approach contributes to the final "users of the policing" – citizens and their safety. Without an evidence-based approach, there is a threat that personal senses and experiences will still drive police practice. Although personal stances are critical in policing and contribute to the development of police officers and police organisations, the subjectiveness of one's point of view may lead to misconceptions. For example, Ilijazi, Milić, Milidragović and Popović (2019) assessed police officers' perceptions of residential burglary hot spots and found that police officers' perceptions of hot burglary areas did not coincide with the actual data. Therefore, it is critical to bring scientific approaches into policing. For practical reasons, that

would tell us about the quality of the policing services and contribute to developing evidence-based practices to improve it. For scientific reasons, it would tell us more about policing and crime, encourage further criminological research, and contribute to establishing evidence-based policing.

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