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Abstract

East London Project: a participatory mixed-method evaluation on how removing enforcement could affect sex workers' safety, health and access to services in East London

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Background: Sex workers' risk of violence and ill-health is shaped by their work environments, community and structural factors, including criminalisation.

Aim: We evaluated the impact of removing police enforcement on sex workers' safety, health and access to services.

Design: Mixed-methods participatory study comprising qualitative research, a prospective cohort study, mathematical modelling and routine data collation.

Setting: Three boroughs in London, UK.

Participants: People aged ≥ 18 years, who provided in-person sexual services.

Interventions: Simulated removal of police enforcement.

Outcomes: Primary – recent or past experience of sexual, physical or emotional violence. Secondary – depression/anxiety symptoms, physical health, chlamydia/gonorrhoea, and service access.

Results: A combination of enforcement by police, local authorities and immigration, being denied justice when reporting violence, and linked cuts to specialist health and support services created harmful

conditions for sex workers. This disproportionately affected cisgender and transgender women who work on the streets, use drugs, are migrants and/or women of colour.

Among women (*n* = 197), street-based sex workers experienced higher levels than indoor sex workers of recent violence from clients (73% vs. 36%), police (42% vs. 7%) and others (67% vs. 17%); homelessness (65% vs. 7%); anxiety and depression (71% vs 35%); physical ill-health (57% vs 31%); and recent law enforcement (87% vs. 9%).

For street-based sex workers, recent arrest was associated with violence from others (adjusted odds ratio (AOR)) 2.77, 95% confidence interval (CI) 1.11 to 6.94). Displacement by police was associated with client violence (AOR 4.35; 95% CI 1.36 to 13.90) as were financial difficulties (AOR 4.66; CI 1.64 to 13.24). Among indoor sex workers, unstable residency (AOR 3.19; 95% CI 1.36 to 7.49) and financial difficulties (AOR 3.66; 95% CI 1.64 to 8.18) contributed to risk of client violence.

Among all genders (*n* = 288), ethnically and racially minoritised sex workers (26.4%) reported more police encounters than white sex workers, partly linked to increased representation in street settings (51.4% vs. 30.7%; *p* = 0.002) but associations remained after adjusting for work setting.

Simulated removal of police displacement and homelessness was associated with a 71% reduction in violence (95% credible interval 55% to 83%). Participants called for a redirection of funds from enforcement towards respectful, peer-led services.

Limitations: Restriction to one urban locality prevents generalisability of findings. More interviews with under-represented participants (e.g. trans/non-binary sex workers) may have yielded further insights into inequities. Correlation between different risk factors restricted outcomes of interest for the modelling analyses, which were largely limited to experience of violence.

Conclusion: Our research adds to international evidence on the harms of criminalisation and enforcement, particularly for women who work on street and/or are racially or ethnically minoritised. Findings add weight to calls to decriminalise sex work, tackle institutionally racist, misogynist and otherwise discriminatory practices against sex workers in police and other agencies, and to (re) commission experience-based, peer-led services by and for sex workers particularly benefiting the most marginalised communities.

Future work: Realist informed trials, co-produced with sex workers, would provide rigorous evidence on effective approaches to protect sex workers' health, safety and rights.

Funding: This synopsis presents independent research funded by the National Institute for Health and Care Research (NIHR) Public Health Research programme as award number 15/55/58.

Plain language summary

Some sex workers experience greater levels of violence, anxiety, depression and drug use than people who do not sell sex. This research evaluated the effects of removing police enforcement on sex workers' safety and health (violence, depression and anxiety) and access to health and social care in East London. The study was participatory: co-researchers with lived experience of sex work or of working closely with sex workers worked with university-based researchers to design, conduct and disseminate the research. We conducted qualitative research (interviews and neighbourhood walks) to understand how police enforcement affected sex workers' safety, health and service access. We measured how much enforcement affected levels of violence, through a cohort study (recruiting participants and following up with them over time). We then developed a mathematical model to simulate the effects of removing enforcement.

In this urban locality, we found that women (cisgender and transgender) who worked on the street experienced far higher levels of police enforcement and reported more violence from all perpetrators, including police themselves, than those working indoors. They reported higher levels of anxiety and depression and were less likely to be getting help for these problems. In our study, sex workers' safety and mental health were affected by entrenched poverty, insecure housing, police enforcement and service cuts. Cisgender and transgender women who worked on the street, used drugs, were migrants and/or were women of colour were particularly targeted for enforcement, denied justice and affected by funding cuts to specialist health and support services. Ethnically and racially minoritised sex workers more frequently worked in lower-paid, street-based settings and, regardless of work setting, were more frequently arrested and imprisoned. Our mathematical modelling suggested that stopping the displacement of street-based sex workers alongside the provision of housing could result in a significant (71%) reduction in client violence. Participants recommended redirecting funds from enforcement towards respectful, peer-led services. Findings add weight to existing international evidence on ending enforcement against sex workers and the need to address other of violence and poor health, including reducing poverty, providing housing and commissioning appropriate, community-led services for sex workers.

SYNOPSIS

Introduction

Sex workers are one of four priority groups identified by the National Inclusion Health Board, which aims to improve the health of the UK's most marginalised and vulnerable populations.[1] Existing research[2–5] demonstrates considerable health inequalities experienced by and within sex-working communities relative to the wider population in relation to rates of violence, human immunodeficiency virus (HIV) and sexually transmitted infections (STIs), alcohol- and drug-related harms, emotional ill health and access to health and social care. These inequalities are shaped by work environments (e.g. working on the street or indoors, working alone or together), community (e.g. availability of services, peer networks) and structural (e.g. laws, poverty, discrimination) factors.[3,4,6,7] Two systematic reviews[3–5] demonstrate that, internationally, increased risk of violence and HIV are associated with financial and housing insecurity, less access to education, an outdoor work environment, stigma, lack of access to clinics or peer-led sex worker organisations, being forced into sex work, criminalisation and enforcement-based policing.

Previous UK-based research[8,9] with cisgender (cis) women selling sex indoors (primarily in managed premises) and on the street indicates that up to 64% report sexual or physical violence at work, up to 46% report anxiety or depression and up to 30% currently inject drugs, with each of these being considerably more prevalent among cis women who sell sex on the street than among cis women who sell sex indoors (very few indoor sex workers reported injecting drugs).[4] Research with sex workers operating independently[10–12] indicates considerably lower levels of each of these health harms. There are few such quantitative data available specific to transgender (trans) women and men (cis and trans) who sell sex in the UK, but data from the USA indicate that trans women who sell sex experience particularly high rates of violence.[13,14] Among sex workers attending genitourinary medicine (GUM) clinics in the UK, prevalence of chlamydia, gonorrhoea and HIV is 10%, 3% and 0.2%, respectively, among cis women and 25%, 17% and 4%, respectively, among cis men.[8,9] Existing research[4,15] indicates a far greater risk of these infections for cis women who sell sex on the street than for cis women who sell sex indoors. No estimates are available specific to trans sex workers, but data from the Netherlands suggest a high prevalence of HIV (18%) among trans sex workers working on the street.[16] These figures reflect significant disparities in health and other harms; historically, cis women who sell sex have been shown to be 12 times more likely to be murdered than other women their age,[17] and cis male and cis female sex workers are one to three times more likely to have chlamydia and gonorrhoea than other GUM clinic attendees. The odds of contracting HIV are 3.4 times higher among cis male sex workers than among non-sex-working men (adjusting for age and sexual identity).[8,9]

Growing evidence internationally indicates that the criminalisation of sex work contributes to the substantial health inequalities experienced by sex workers. Sex workers who experience police enforcement or abuse are three times more likely to experience sexual or physical violence from clients, twice as likely to test positive for a STI or HIV and less likely to use condoms with clients than sex workers who do not. Although there has been less research on the effect of criminalisation on mental health or drug use, the limited evidence suggests that repressive policing adversely affects mental health and increases drug use-related harms among sex workers.[6] Social science research illustrates how enforcement in criminalised environments disrupts safety strategies; institutionalises violence and coercion through police abuse, extortion and denied justice; and restricts access to health and social care services.[6] It also reinforces existing structural injustices by disproportionately targeting cis and trans women who work on the street and/or use drugs, migrants, people of colour and trans women specifically.[6] Sex workers experience widespread stigma and discrimination in the criminal justice system,[18,19] variously reflecting a 'discourse of disposability',[20] blame, presumed vulnerability and powerlessness.[21,22] Others have highlighted the normalised 'everyday violence' that occurs when

sex workers do not receive protection or justice, including when policies are grounded in notions that sex workers inevitably experience violence.[23] Meanwhile, emerging international evidence suggests that decriminalising sex work can significantly improve workplace safety and care access and reduce health risks.[18] Understanding how different legislation has an impact on sex workers' health is critical to designing effective, inclusive and rights-based public health interventions.

Conceptual framework

In the original study proposal, we drew on concepts used in public health and social science to understand how criminalisation and enforcement may interact with other social and structural factors to affect sex workers' health. The 'risk environment' is an analytical tool that considers how different types of environments (physical, social, economic and political) and levels of environmental influence (micro and macro) shape risk.[24] First developed to analyse drug-related harms, this concept has been used to examine the contexts of HIV and violence experienced by sex workers.[3,25] Drawing on this concept, Shannon *et al.*[5] propose a structural determinants framework for sex workers' vulnerability to HIV, depicting how factors at macro-structural (e.g. criminalisation, housing), community (e.g. access to sex worker organisations) and work environment (e.g. safety systems) levels interact with individual behaviours and vulnerabilities to affect risk. Our interdisciplinary collaborations expanded during the research, and as such we drew on a wide range of concepts across sociology and criminology, particularly to guide our qualitative analysis, including those of 'social justice',[26,27] 'social harms',[28] 'necropolitics'[29] and 'assemblage theory'.[30] We describe and discuss these concepts as they relate to this research in the conceptual framework section of the main qualitative article.[31] In brief, we used the term 'necropolitical assemblages' to describe the interactions and tensions between police, immigration, (public) health and social welfare services (assemblages) that led to increasingly unsafe and precarious working and living conditions for sex workers in this context (necropolitics). We used the concept of restorative social justice[27] – whereby excluded communities can, with appropriate resources, recognition and representation,[26] claim justice and support 'in and on their own terms, in the contexts of their lives'[31] rather than through hostile systems – to analyse how sex workers navigated, responded to and organised against these harms. Below we provide more detail on how we drew on this conceptual literature during qualitative analyses (see *Methodologies*, *Qualitative study*).

Study context

Under current legislation in England, fines, civil and criminal measures penalise loitering, soliciting (sex workers seeking clients) and 'kerb crawling' (clients seeking sex workers) in public places. Working indoors with third parties, including with other sex workers, can also result in prosecution for keeping, managing or assisting in the management of a brothel. Contravention of associated criminal behaviour orders, community protection notices, dispersal orders or brothel-closure orders can result in fines and prison sentences. Sex workers also face enforcement from local authorities and immigration officers using laws relating to drugs, immigration, 'anti-social behaviour' (ASB) and public order.[32] In practice, levels of enforcement vary considerably between locations. Although some police forces continue to enforce against sex workers and their clients, others have previously adopted a non-enforcement approach, including in parts of Leeds and London.[33] In 2016, the UK Home Affairs Select Committee (HASC) recommended removing penalties for street sex work and working indoors with other people for safety.[34] They did not endorse either a model of decriminalisation or the criminalisation of the purchase of sex, citing the need for more evidence. Since the publication of the HASC report, updated National Police Chief Council guidance[35,36] urges officers to prioritise the safety of sex workers over enforcement, but arrests and prosecutions of sex workers are still widely documented by sex worker rights and support organisations. Debates around sex work laws continue and are polarised. The 2018 call by an all-party parliamentary group to criminalise the purchase of sex with a view to ending demand for sex work was contested by sex worker rights organisations, other civil society groups and academics for marginalising sex workers further and failing to recognise the diversity of experience and identity within sex work.[37,38] Alongside international bodies, these organisations argue in favour of decriminalising sex work to reduce harms and rights violations against sex workers.[39–41]

Sex worker support services have long been recognised as key to addressing the complex health and social care needs of this marginalised and dynamic population in the UK; internationally, the success of sex worker support services in halting early outbreaks of HIV, syphilis and tuberculosis among sex workers is evident.[42,43] Our previous London-based research[44] demonstrated that these services remain as vital as ever to sex workers' sexual health; we found that women who had been visited by an outreach worker (defined as a support worker or nurse who visits sex work venues to provide support, referral to services and sometimes STI testing) in the previous year had a 73% reduction in risk of contracting a STI, and women highly valued these services as sources of specialist, non-judgemental care. Sex worker support services work in conjunction with other local services to assist with sexual health, substance use and mental health, to support victims of violence and to support sex workers to access housing, benefits, legal and immigration advice. They may also work with sex workers and other services to avoid the criminalisation that further compounds their marginalisation and health risks. Open Doors (London, UK) is a specialist health and support service for sex workers that has operated in East London for the past 15 years. They work to promote sexual health and provide clinical services on an outreach basis in street-based sex work areas and indoor sex work venues, as well as in fixed-site clinics and informal drop-in centres. They also provide 'case management', which entails working with clients to identify their health and social care needs and referring them to appropriate services (e.g. primary care, housing, benefits). They have a dedicated independent sexual violence advisor to support sex workers experiencing violence and they provide wider support, helping sex workers report violence to the police through a community-based scheme, National Ugly Mugs (Manchester, UK), and advising on seeking other employment for those who wish to leave sex work.

Changes in policy context, policing practices and specialist sex worker support services

Over the past 15 years there has been a steady shift from traditional enforcement strategies against sex workers to 'engagement and support orders. These require street sex workers to attend mandatory appointments with identified health and/or support agencies to avoid court proceedings, with the ultimate goal of 'exiting' women from sex work.[45] This approach is termed 'forced welfarism' by Scoular and O'Neill,[22] who argue that this leads to 'conditional citizenship' whereby women who do not or cannot meet these requirements remain criminalised and constructed as 'antisocial'. This approach has been introduced alongside increasing enforcement against men buying sex, reflecting what Scoular and Carline term a 'creeping neo-abolitionism' with the intention of 'ending demand' for paid sex.[45] Over a similar time period, sex work policy debates have become dominated by concerns about trafficking, with frequent conflation in media and political discourse of migrant sex work and trafficking. These discourses rarely consider how hostile immigration systems and broader (structural) xenophobia, racism and classism harm migrants who sell sex.[46] These arguments are further expanded in the qualitative article.[31]

The impact of these policy shifts was evident in the study boroughs (Hackney, Newham and Tower Hamlets) during the course of this research. There were notable changes in policing practices and the availability of specialist sex worker support services, both of which had implications for study design and implementation. At the time of writing the proposal, long-standing advocacy by Open Doors (a key collaborator in this research), which provided services in all three study boroughs, had led to an effective cessation in police enforcement against street-based sex workers in one of the study boroughs, Hackney, between 2015 and 2017. This variation in enforcement practices across the study boroughs, as well as the presence of Open Doors, was the primary motivation for the selection of these boroughs as study sites. We envisioned that this would facilitate access to and support for participants as well as opportunities to observe different models of policing. In the context of changes in personnel, commissioning and political agendas locally, enforcement increased considerably after the project started, and Open Doors gradually had its funding removed for off-street outreach in all three boroughs and on-street outreach in two of the boroughs. Open Doors is the latest in a long line of services to face unsustainable funding cuts in London and across England in a context where sex work policies and service commissioning increasingly prioritise exiting of sex work.[22] This also took place in the context of

widespread cuts to specialist services and broader social and health services across the UK, which have seriously limited integrated care and support for sex workers.[40] These changes to service provision and enforcement approaches are discussed in detail in the main findings of the qualitative study[31] and also considered in routine data analyses (see below).

In this research we sought to characterise and observe the effects of this naturally occurring diversity in policing, through an innovative combination of epidemiological, social science, mathematical modelling and participatory methods, to examine how and to what extent this affected sex workers' safety, health and service access and to predict the probable effects of removing such enforcement (see *Aims and objectives*). Our research design, however, was not dependent on area-level comparisons, so the changes described above did not prevent us from assessing how natural diversity in policing practices affects sex workers' health and safety. The funding cuts experienced by Open Doors had implications for our research design and our ability to measure how the presence of a sex worker support service changes police enforcement practices over time (see *Aims and objectives*). However, through the qualitative study we were able to document the relationship between enforcement and changing service (de)commissioning, and the real-time impacts that such service cuts had on sex workers' safety, health and rights.

Aims and objectives

The aim of the research was to evaluate the impact of removing sex work-related police enforcement sanctions on sex workers' safety, health (physical, sexual and mental) and access to health and social care in East London. The research focused on three boroughs – Hackney, Newham and Tower Hamlets – and included sex workers of all genders (cis and trans women and men, and non-binary people).

The study had six linked objectives:

1. to investigate the pathways through which sex work-related police enforcement sanctions, and their removal, shape our outcomes of interest (i.e. sex workers' safety; physical, sexual and mental health; and access to health and social care), including by interacting with other macro-structural, community and work-environment factors
2. to use formative qualitative data to further develop our working 'theory of change' model* and define explanatory, mediating and outcome variables for objective 3
3. to measure associations over time between (non-)exposure to police enforcement sanctions and outcomes of interest, including the mediating effect of other macro-structural, community and work-environment factors (based on our theory of change) to parameterise the mathematical model (see objective 6)
4. to measure how the presence of a sex worker support service (e.g. Open Doors) changes police enforcement practices over time
5. to identify social, political, economic and operational factors that influence the acceptability, feasibility and implementation of non-enforcement to inform any scale-up
6. to estimate, with mathematical modelling, the effects of removing police enforcement sanctions on sex workers' experiences of violence, HIV, STIs, mental ill health and access to health and social care (outcomes of interest) in East London.

These aims and objectives reflect minor revisions from the original study proposal (e.g. the explicit inclusion of physical health effects alongside sexual and mental health effects) developed through our participatory approach (see *Interdisciplinary, participatory action research*). *As part of our research, we developed and refined a 'theory of change' to guide our analysis of how removal of police enforcement could impact on sex workers' safety, health and service access.

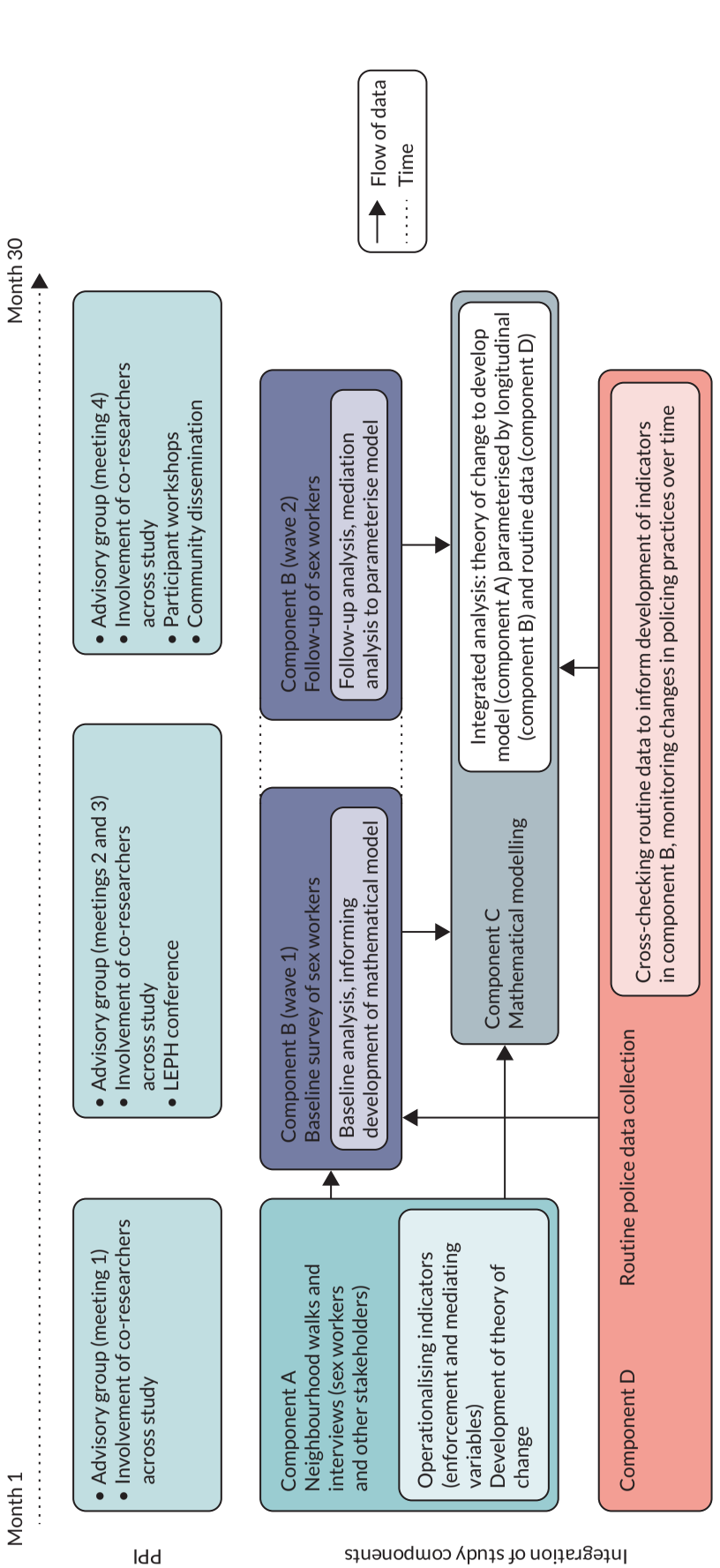

FIGURE 1 Flow chart depicting integration of study components and flow of data. PPI, patient and public involvement.

Methods

Given the difficulties of using traditional methods to evaluate complex health interventions, we used an innovative, simulated evaluation design that was theory driven and parameterised through a 'natural experiment'.[46,47] This comprised four linked components (*Figure 1*):

1. qualitative formative research, comprising in-depth interviews with sex workers, police and other key stakeholders, and ethnographic neighbourhood walks (objectives 1 and 2)
2. prospective cohort study with sex workers, collecting linked behavioural and biological survey data at two time points (objectives 3 and 4)
3. mathematical (deterministic) model of HIV/STI transmission and other outcomes (violent incidents, depression/anxiety and access to health and social care) (objective 6) [this was the original intent, but low uptake of HIV/STI testing precluded modelling of HIV/STI transmission (see *Changes to protocol*)]
4. collation of routine data on sex work-related enforcement in all three boroughs (objectives 1–4 and 6).

Mixed-method approaches

We used epidemiological methods (component B) to measure the effects of naturally occurring variation in enforcement across the three study boroughs. This was used to parameterise the mathematical model (component C) by informing the development of the conceptual framework underpinning the model. Qualitative methods (component A) and collaboration with sex workers (project wide) were used to theorise the pathways through which these effects are likely to be produced, and this formed the basis for epidemiological and modelling analyses (components B and C). Consistent with an approach of 'expansion' or 'grounding' epidemiology in prior qualitative work (component A), we refined measures of the exposure (enforcement), mediator (e.g. housing, work environment) and outcome variables (component B), corroborated against routine data on enforcement (component D). Qualitative data were also used to explore how (non-)enforcement is implemented in practice, and the contextual factors that shape its acceptability and feasibility, from the perspectives of sex workers and 'implementers', including in areas where it has not yet been introduced. Last, iteration between the qualitative, epidemiological, modelling and routine data was used to explain and interrogate the complex social processes measured and associations observed, including through community involvement/engagement activities. The chronology and integration of the study components is summarised in *Figure 1*.

The mathematical model acted as a formal integrative component extending and integrating the results of the quantitative and qualitative data analyses. Evidence from the qualitative analysis was used to support assumptions about causal relationships between structural factors and rates of violence experienced by street-based sex workers from clients. We focused on client violence in the model as one example of the violence experienced by sex workers and because the causal pathways between enforcement and client violence were clearer to conceptualise in a mathematical model than the more complex and indirect pathways between enforcement and violence from intimate partners and other members of the community. Causal relationships were built into a mathematical model and parameterised to fit the data observed in the quantitative analysis. We used the model to estimate the proportion of violence attributable to each structural factor and to predict the reduction in violence that would occur if particular interventions were implemented that change the prevalence of the structural factors.

Interdisciplinary, participatory action research

This research drew on participatory action research methodologies in an interdisciplinary project. Co-applicants with expertise spanning epidemiology, sociology, mathematical modelling, criminology, participatory action research, sexual health medicine and evaluation developed the original research proposal in collaboration with Open Doors and in consultation with a number of sex workers and sex worker organisations [including the English Collective of Prostitutes (London, UK) and the then-named Sex Worker Open University, now the Sex Worker Advocacy and Resistance Movement (London, UK)], some of whom became involved in the research team and/or advisory group. Early discussions between these organisations, individuals and the co-applicants on this research highlighted ways in which police

and local-authority enforcement actions and broader criminalisation endangered sex workers, eroded trust and created barriers to housing and welfare services. These discussions also informed proposed research methods and recruitment strategies. Once funding had been secured, university-based staff hired teams of freelance community co-researchers (see below) to work in partnership on study design, implementation, analysis and dissemination. We presented and sought feedback on our proposed research at the UK Network of Sex Work Projects conference Policy, Policing & Protection (Manchester, UK, March 2015), after being invited to present and join a panel discussion on the health implications of sex work criminalisation. There was strong support for the proposal and we gained valuable insight into the ways that sex workers feel that police enforcement and criminalisation currently affect their health and safety in London and across the UK.

The project was steered by an advisory group that included sex workers, activists, residents, service providers, local-authority and police representatives and academics, some of whom had provided input on the original proposal. The study advisory group met four times throughout the course of the study. They advised on the development of research instruments, sampling methods, interpretation of findings, write-up and dissemination.

Co-researchers included people with lived experience of sex work or of working closely with sex workers in sex worker-led organisations or in health and support services. They had varying prior research experience, ranging from being entirely new to research to being doctoral graduates, and combined expertise and interests in health promotion, criminology, sociology, anthropology, gender and sexuality studies, psychology, statistics, community organising, journalism and mathematical modelling. In the qualitative component, we began with collaborative learning sessions facilitated by a university-based staff member, during which we discussed qualitative and participatory methods, ethics and context; co-refined our research design, questions and tools; and conducted pilot interviews and walks [see *Qualitative study (component A)*]. University staff and co-researchers worked together to recruit participants, conduct interviews and walks, analyse data and disseminate findings, with regular team meetings to plan and adapt the research. Co-researchers with greater availability became more involved in analysis, writing, dissemination and decision-making, including in relation to resource allocation for remaining fieldwork and analysis [see *Qualitative study (component A)*, *Analysis*]. In the quantitative component, co-researchers with expertise in sex work, service provision, epidemiology, sociology, statistics and/or criminology contributed to developing the methods, gathering and analysing the data and disseminating and writing up findings. Regular research team debriefs provided continuous feedback, including on survey burden, and various recommendations were adopted, including on payment amounts, interview locations and conduct. We consulted with local sex worker support services and sex worker advocacy groups to define appropriate methods of recruitment and ultimately assist with participant recruitment through their networks. Participatory approaches were used to develop and define the focus of the mathematical model in several ways. A presentation on modelling methods attended by university staff and co-researchers was followed by discussions to agree potential outcomes, stratification of population groups and the focus of structural indicators. Subsequent modelling meetings included co-researchers who contributed feedback on interpretation of preliminary modelling results and further analyses needed.

Following the end of qualitative and quantitative fieldwork, preliminary findings and recommendations were presented at the Fifth International Conference on Law Enforcement and Public Health (Edinburgh, UK, 21–23 October 2019)[48] and at three community events in each of the study boroughs in February and early March 2020. Prior to the conference, co-researchers and university-based staff presented preliminary findings to the wider group of co-researchers and the study advisory group, incorporating their feedback on interpretation and recommendations into the conference presentations. The three community events were attended by study participants as well as other sex workers, service providers, police, local-authority representatives and third-sector organisations. These events combined presentations and group discussions led by one of the co-researchers, during which we sought feedback on the emerging findings and recommendations, with particular emphasis on hearing from participants

and other sex workers. We wrote up anonymised notes from these events and used these to inform project outputs.

Through this participatory approach we have sought to challenge hierarchies of knowledge production about sex workers' health and related epistemic exploitation, which has seen sex workers frequently excluded from related discussions and/or expected to educate non-sex-working academics and other privileged communities about their lives without adequate compensation or recognition as experts in their own lives.[49] However, it is important to acknowledge persisting power imbalances in the context of an interdisciplinary research grant held by university-based staff hiring co-researchers on a freelance basis. In a forthcoming methodological article led by one of the co-researchers on this project, we discuss the tensions, complexities and potential of this approach.[50]

Additional detail on methodologies

Full details on study methods are included in the four articles published from the study.[31,51–53] In this synopsis we outline additional detail on methods not published in these articles.

Qualitative study (component A)

The conceptual framework and methods we used in the qualitative component are included in a published journal article.[31] As described in the article, between October 2017 and June 2019 we conducted 47 in-depth individual interviews with people who sold sex ($n = 26$) and other stakeholders whose work related to sex work(ers) ($n = 21$) and six ethnographic neighbourhood walks/walking interviews in the study boroughs.[31] Sex worker participants were selected purposively, for maximum diversity in age, gender/identity, ethnicity, migration status, sex work sector, contact with sex worker services, and enforcement experience. Other stakeholders, including service providers, police, activists, and local-authority commissioners, were selected for maximum diversity in sector and borough. Funding cuts began before the study commenced and continued as the research progressed. Therefore, we were able to interview participants and stakeholders before and after service cuts in two of the boroughs and after service cuts in one of the boroughs. In the article we provide more details of the demographics, lived experiences and work of participants and other stakeholders. Here we provide additional methods-related information not included in the article.

We recruited sex-working participants through sex worker health and support services ($n = 14$) and various community channels ($n = 12$). The former involved either spending time in drop-ins and clinics so that staff could introduce potentially interested participants to us or meeting participants at times arranged through telephone contact with service staff (with participants' consent). The latter involved some co-researchers reaching out to sex workers through their networks, directly contacting sex workers advertising online, posting about the study on sex work fora and social media, visiting sex work venues we had been introduced to by outreach workers or participants, visiting street sex work areas (see *Walks*) and participants inviting their sex-working friends to take part in the study. We interviewed participants of diverse gender identities (cis and trans women, cis men and non-binary participants) working in different sectors in each borough. However, we did not manage to interview any trans men and we had less success recruiting participants who identified as trans women or non-binary, participants who worked on the street in one of the boroughs and migrant women who worked on the street in all boroughs (previous research indicates that they are less likely to be homeless and use drugs than women working on street who are UK citizens).[54,55] Few participants had insecure or undocumented migration status. We discuss the limitations this posed in the qualitative study article[31] and the *Discussion* section of this report.

Interviews

We identified other stakeholders in various ways. First, we sought the advice of collaborators, advisory group members and stakeholders interviewed to identify key agencies, sectors and individuals whose work pertained to the research question. Second, we noted key agencies repeatedly mentioned in

interviews with participants. Last, if no specific individual had been recommended, or if the individual mentioned had left their post, we approached recommended organisations and individuals according to their current job titles. In the case of other adults working in the sex industry (i.e. in roles other than selling sex), we approached people we met during fieldwork and, in one case, someone recommended by a study participant. We had greater difficulty recruiting stakeholders in housing, community safety, police and some sex worker support services, but we were ultimately able to interview police, service providers and local authority representatives across all three boroughs. We suspect that the difficulty in recruiting some stakeholders is related to both the conditions of austerity affecting their workloads/capacity and the sensitivities of the research topic. We had little success in conducting formal interviews with 'other adults' working in the sex industry, such as receptionists, managers and security guards. We had originally planned to undertake up to 10 such interviews, depending on sampling considerations, recruitment opportunities and resources available. We sought to ensure that at least half of all interviews were with sex workers and that we interviewed a wide range of other stakeholders across diverse sectors in each borough. Of the five 'other adults' working in the sex industry we met during fieldwork and invited to interview, just one ultimately participated. We suspect that this may relate in part to fears over criminalisation, since current legislation criminalises all third parties working in the sex industry. Because securing additional interviews involved considerable time commitment, we decided to prioritise interviews with sex workers to ensure that their voices were centred in the research. Nevertheless, during neighbourhood walks and recruitment visits to sex work venues, we engaged in multiple informal conversations with receptionists, managers, staff and security guards in locations where participants worked and/or spent time. These provided important insights into working conditions and the broader context in which participants worked and lived.

During the interviews we asked participants about their experiences of police and other enforcement, safety and violence at and outside of work, reporting violence and other crimes to the police, access to health and social services (e.g. housing, benefits, legal and immigration advice), community and other support networks and any changes they had experienced in recent years. We also asked participants for their views on current sex work laws in England, client criminalisation in Sweden and the decriminalisation of sex work in New Zealand – models that are widely debated internationally and that have been recommended for consideration in England by the HASC.[34] For participants who did not know or were unsure about the specifics of these laws, we described them briefly and sought their perspectives on each one in turn. We asked other stakeholders about the same topics as participants, and about what they perceived to be the role of their and other institutions (e.g. police, local authorities, health services) in shaping these issues. We developed interview topic guides informed by our review of the international and UK qualitative literature on this subject[6] and by our team and advisory group's collective knowledge about sex work policing, service commissioning and provision, the sex industry and sex workers' lived experiences locally.

At the end of each interview, we completed a demographic form with questions on the participant's age, gender identity (at and outside of work), ethnicity, work sector and duration in work, and, for sex-working participants, yes/no questions about experiences of enforcement at work, contact with sex worker health and support services, and membership in sex worker organisations. Participants either filled these in themselves or, if they preferred, the interviewer asked them the questions that they had not already provided information about during the interview itself. For the six interviews conducted through interpretation, we hired Portuguese- and Romanian-speaking interpreters who had experience of working with sex worker support services (freelance or employed) and who were, in all but one case, known to the participant.

Walks

Of the six neighbourhood walks, three were led by people who sold sex in the study boroughs. These were similar to 'walking interviews' in which participants take the researcher(s) around spaces that form part of their everyday lives and engage in discussion about their lived experiences of these spaces, offering opportunities for more participant-led data collection.[56] We invited participants to map out

the spaces in which they worked and spent time, with particular reference to where they encountered and/or avoided police, other authorities and services, where they experienced threats to their safety and well-being and where they did and did not feel comfortable. We then invited them to walk us (1 or 2 researchers, in one case accompanied by an interpreter) around spaces that they felt were safe and appropriate for us to visit together. We audio-recorded the mapping and walks, with participant consent, ensuring that we recorded when only their and our voices were audible. Two of these walks were led by cis women through street sex work areas in which they worked and lived. The third was led by a cis male sex worker who took the researcher to an area where he met clients, socialised and used to live, including outdoor spaces, virtual spaces (apps) and bars. The three remaining walks took place in street sex work areas, led by one of the co-researchers with lived experience of street sex work and included 1 to 2 other members of the research team. During these walks we walked and drove around main streets, told sex workers about the research, offered condoms and information on sex worker-friendly health, support and rights services, engaged in informal conversations with sex workers and other individuals present in street and other settings (e.g. fast-food restaurants where participants spent time) and observed these spaces. These walks offered us more in-depth insight into the spaces in which participants worked, lived and experienced enforcement. Afterwards, we wrote fieldnotes to help contextualise the audio-recorded walk data and the spaces that participants described in fixed-site interviews.

Informed consent

All participants in interviews and walks provided informed consent, written or in the presence of a witness independent of the research team, and were assured of the confidential and anonymous nature of the study. We started by giving participants £20 or £40 in thanks for participation in a fixed-site interview or longer mapping/walking interview, respectively. We later increased the former to £40 on the advice of co-researchers to compensate participants more adequately for the time they contributed to the research (walking interviews had already been completed by this time). We offered participants and other sex workers information on relevant sex worker health, support and rights agencies, contacting organisations on a participant's behalf if they wished. After each interview, the interviewer debriefed with the lead researcher to check in on their and the participant's safety and well-being, provide any necessary support/referrals, discuss any ethics or methodological concerns and summarise the main themes of the interview. For fieldwork outside services, researchers worked in pairs and we operated an 'on-call' system, whereby another member of the research team, and in the case of night fieldwork university security staff, were aware of the researchers' whereabouts and expected finish time and checked in with them by telephone regularly. Given the sensitivities around police contact in the context of this project, we agreed that the on-call researcher would call the police only as a last resort (i.e. in the exceptional circumstance of being unable to make contact with either researcher, having exhausted all means of communication). This was not necessary at any point during the research.

The qualitative study received approval from the London School of Hygiene & Tropical Medicine (LSHTM) ethics committee (ref: 13919) and the London Stanmore research ethics committee (ref: 204494).

Analysis

Interviews and walks with participants were audio-recorded, transcribed verbatim by a professional transcription agency operating a strict confidentiality policy and reviewed by interviewers for accuracy and completeness. For interviews conducted using interpretation, transcripts were translated into English by professional bilingual translators, with written explanations where needed to provide context and retain linguistic nuance.

Our analysis focused primarily on participants' accounts, in keeping with our participatory approach. We complemented this with other stakeholders' accounts to unpack the local institutional practices and politics that shaped participants' experiences. University-based staff and co-researchers analysed study data using a thematic, grounded approach, identifying common (sub-)themes inductively. One university-based staff member and three co-researchers began by reviewing transcripts and fieldnotes

from interviews and walks to familiarise themselves with and contextualise the data and identify emerging themes. We coded transcripts manually, in groups and pairs, developing a coding scheme using a combination of a priori topics of interest (derived from the interview topic guide) and in vivo codes (additional topics or themes we identified in the data based on how participants talked about their experiences). We discussed and refined the meaning of these codes as they emerged and wrote analytical memos supported and contextualised by interview and walk fieldnotes. One university-based staff member and one co-researcher continued to code transcripts and refine this coding scheme, aided by NVivo 12 (QSR International, Warrington, UK) qualitative analysis software, in discussion with an additional university-based staff member and two co-researchers. During group mapping workshops we linked together main codes and sub-codes to identify broader themes and concepts. During this process, we used fieldnotes from interviews and walks to contextualise the data and we used relevant conceptual literature to aid interpretation. Building on the conceptual framework we outlined at study proposal stage (see *Introduction*), and as our interdisciplinary collaborations grew, we drew on concepts across sociology and criminology including those of 'social justice'[26,27] and 'social harms',[28] 'necro-politics'[29] and 'assemblage theory'.[30] We describe and discuss these concepts as they relate to this research in the conceptual framework section of the main qualitative article.[31]

One university-based staff member and one co-researcher worked up a preliminary analysis to present at the Fifth International Conference on Law Enforcement and Public Health,[48] which forms the basis of the qualitative study article.[31] The university-based staff member further developed and drafted the qualitative study article in discussion with the rest of the qualitative team (three co-researchers and one university-based staff), who, together with two members of the cohort study team, provided substantive conceptual, analytical and applied input into the draft article. We sought feedback on preliminary findings and recommendations, first from the wider cohort study team, the study advisory group and collaborators in the lead-up to the aforementioned conference presentation and then, several months later, from participants, other sex workers and stakeholders during community dissemination workshops in February and March 2020.

Cohort study (component B)

As outlined in the main cohort study article,[51] from May 2018 to September 2019, a participatory research team administered baseline and 6-month follow-up interviews and offered voluntary chlamydia, gonorrhoea and HIV screening to sex workers of diverse genders working across a range of settings (e.g. street, flats, saunas, independently) in East London (Hackney, Newham and Tower Hamlets). To be eligible, sex workers had to have provided in-person sexual services in the previous 3 months and be at least 18 years of age. The cohort study received approval from LSHTM and Stanmore research ethics committees (IRAS ID 231206). Here we summarise some additional information on the methods not included in the main article.

Achieving a probabilistic sample through time–location sampling or systematic random sampling requires a sampling frame for which the population size must be estimated. We mapped all the known locations where sex workers provide services to create three sampling frames for sex workers based on where they work: (1) individuals working from managed flats, people working independently or escorts who advertise on their own websites or online platforms; (2) sex workers working in saunas or massage parlours; and (3) sex workers working on the street. In brief, online mapping involved systematic Google (Google Inc., Mountain View, CA, USA) searches for geographic tags and key search terms for promoting sexual services that were co-developed with sex workers. The first 100 results for each search were entered into a spreadsheet, the list was deduplicated and details on 103 unique London-based sites were identified, which included an estimated 32,000 profiles (estimation based on numbers of photographs/adverts placed on each site). From 103 sites, 14 online platforms for independent adverts were selected. These were selected based on recommendations from co-researchers for being the most commonly used or because they included the largest numbers of individual profiles. They were then pre-filtered for (1) duplicate profiles (i.e. sex workers could post only one advert/profile), (2) individual sex

worker telephone numbers (i.e. sex workers could not use a centralised number, such as for an agency) and (3) diversity among the sex working population (i.e. specialist sites for male, trans and gender-fluid sex workers). From these 14 sites, we collected 11,532 telephone numbers from 13,097 profiles. After deduplication, approximately 7746 individual profiles were identified, from which 4855 were contacted using automated (bulk) text message, e-mail or telephone call. Previously, neighbourhood walks to collect information from adverts posted in local neighbourhoods had identified seven physical indoor venues. Outreach with specialist sex worker support services identified five street locations, resulting in 14 outdoor time–location sampling blocks.

Following time–location sampling of sex workers working on the street and targeted sampling of online profiles, it was necessary to expand study recruitment in several ways because of slow uptake. First, we boosted uptake with convenience sampling in NHS clinics and snowball sampling (including recruitment through friends or social networks). Second, we expanded recruitment of indoor sex workers to the whole of London, on the basis that they are more mobile than those working on the street. Third, we lengthened baseline recruitment for sex workers working on the street to include recruitment of new participants at follow-up, comparable to open cohort methods used in other contexts.[57] The research team invited sex workers by e-mail or telephone or in person to self-complete a structured questionnaire on a tablet, online or, if requested, administered by the team. The survey, created using Open Data Kit version 1.28.4 (Get ODK Inc., getodk.org), was available in multiple languages spoken by sex workers in East London (i.e. English, Brazilian Portuguese, Polish and Romanian) and members of the research team were fluent in some of these languages. Telephone translators were used for other languages not known to those in the research team. Three attempts were made to follow up baseline participants by telephone, e-mail and street outreach to original recruitment locations. Participants were given £20 reimbursement for travel costs, refreshments and time; as in the qualitative study, this was increased to £40 midway through data collection following advice from co-researchers. Participants were also given information about sex worker-friendly health and support agencies locally.

Data were collected on demographics, organisation of sex work, use of health and social care services (e.g. housing, benefits), contact with/membership of sex worker organisations, mental and physical health, experiences of enforcement and other contact with police and immigration officers, violence, reporting violence to police, sexual practices and substance use. Indicators were drawn from validated measures where possible, including the Patient Health Questionnaire-2 item and Generalised Anxiety Disorder-2 item tool measuring depression and anxiety, respectively;[58,59] the Alcohol Use Disorders Identification Test – Consumption (AUDIT-C) tool measuring alcohol use[60] and the Minimum European Health Module (MEHM) tool. Where such tools were not available, measures were developed to be comparable with other sex worker surveys and based on existing and emerging insights from the qualitative component of this research. Experiences of violence (the primary outcome) were drawn from items from the World Health Organization (WHO)'s multi-country study of violence against women,[61–63] combined to create composite measures (see *Appendix 1*, Q704–6), and from previous surveys with sex workers.[15,44,64,65] Experiences of sexual, physical and emotional violence were broken down by perpetrator, including (1) clients, (2) police, (3) intimate partners and (4) other members of the community including residents, neighbours and drug dealers. In addition, a question was included on whether or not sex or money had been accepted by police in exchange for no arrest.

Approaches to statistical analyses are reported in the published articles.[51,52] In brief, we used generalised estimating equation (GEE) logistic regression with an exchangeable correlation matrix in all analyses. These models take into account the correlation of repeated observations on some participants so that analyses included all participants irrespective of follow-up.

Research team safety

During all fieldwork visits, research team staff checked in and out with a research leader at the start and end of a fieldwork shift. Night fieldwork was scheduled in 6- to 8-hour shifts to achieve a balance between safety and sufficient time to meet and recruit sex workers. Night fieldwork teams always

went out in pairs, at least one of whom had experience of working on the street or providing outreach with a sex worker support service. For safety, cars were used throughout night fieldwork, but research team pairs would walk up and down the streets nearby the stationed car. For night fieldwork, teams were equipped with emergency buttons similar to those used by NHS and care workers to make home visits. These provide updated geographic information system (GIS) co-ordinates and have a quick dial to emergency services. In addition, LSHTM security made check-in calls every 1 to 2 hours throughout the fieldwork to request updates on location and any issues. As with the qualitative study, we agreed that the on-call researcher would call the police only as a last resort, and this was not necessary at any point during the research. Interviews for night fieldwork were conducted in 24-hour restaurants or scheduled for a later day if a restaurant was not available. On rare occasions (< 5), interviews were conducted in a team member's car. The research lead was always on call in case of questions, security or safeguarding issues. Regular team briefings at the end of each fieldwork session ensured that any issues of safeguarding were acted on promptly should they arise. They also provided an opportunity for research teams to talk through the interviews and any challenging topics that arose.

Biological sample collection

Voluntary, self-administered screening for chlamydia, gonorrhoea and HIV was offered in person or by post. Alternatively, participants were asked if they consented to their last test result from participating clinics being recorded as part of the research. HIV screening in person was administered using OraSure (OraSure Technologies, Inc., Bethlehem, PA, USA) rapid oral tests; blood prick tests were used for postal screening and positive results confirmed by Western blot. Positive results were delivered within 24 hours by Dr Sarah Creighton, consultant in sexual health medicine, who arranged confirmatory testing. Negative results were delivered by automated text message or within 72 hours by the project team.

Handling duplicate individuals

Continuity in research teams for each area was maintained to reduce duplicate interviews. Manual searching of contact information sheets used for recontacting individuals during follow-up were used to identify any duplicates at baseline and follow-up (two individuals). The duplicated interviews were removed from the data set. Other methods to identify duplicates were through telephone numbers and (online only) through an anonymised internet protocol (IP) address from the ODK server.

Mathematical modelling (component C)

The objective of the mathematical modelling was to estimate the impact of reducing or removing police enforcement on sex workers' health, including experiences of violence, HIV and STIs, emotional ill health and access to health and social care services. The methods and study are described fully in the modelling study article.[53] In brief, we developed a deterministic, compartmental, differential equation model. Each compartment represents a group and differential equations account for the rates of movements between the groups. In this case, there were eight compartments representing all possible combinations of three binary variables: recent violence, recent police displacement and current homelessness. These variables were chosen, and the model parameterised, based on outcomes from the cohort study and qualitative study, as described here.

Outcomes of interest originally proposed to be associated with police enforcement included experiences of violence, HIV, STIs, emotional ill health and access to health and social care services. The modelling study objectives were narrowed down, based on discussion of preliminary results from the cohort study and qualitative study, during a series of meetings attended by the modelling researchers, cohort and qualitative study leads and co-researchers with an interest in modelling. During these meetings it was decided to focus the model on physical and sexual violence from clients as experienced by cis and trans women who sell sex on street. Cis and trans men were excluded from this analysis given that they represented only a small proportion of the street-based sample and given differences in policing and experience of violence between male and female participants. Based on the results of the qualitative and cohort studies, and the very small number of cis or trans women working in street settings who

accepted testing for STIs or HIV (*n* = 51/90), experience of violence was determined to be both the most important focus in this population and the most pragmatic option. This revised approach therefore avoided overshadowing high rates of sexual or physical violence (*n* = 65/89, 73%) by focusing on chlamydia or gonorrhoea (*n* = 8/51, 17%), which were considered to be lower priority health issues by co-researchers and study participants.

Because of the complexity of the questions and the limited corresponding quantitative data available to parameterise the model, it was decided to focus on a narrow question on police enforcement and one additional co-variate that interacts with police enforcement to have an impact on sex workers' experience of violence, and for which interventions to remove that co-variate could be modelled. Insights from the qualitative research and from co-researchers advising on the modelling indicated that drug use and homelessness were highly correlated with each other and that both had an impact on experiences of violence. Homelessness was a significant predictor of violence among street-based female sex workers in unadjusted statistical analyses in the cohort study, although it was not significant in adjusted analyses, whereas drug use was not a significant predictor because of near ubiquitous drug use in this study sub-population. Police displacement (rather than arrest or some other measure of police interaction) was identified as a particularly prevalent and important factor increasing exposure to violence in qualitative and quantitative analysis and one that interacts with homelessness (whereby sex workers who were homeless were most likely to experience displacement by police). Therefore, the differential equation model developed divides a theoretical population of sex workers into compartments based on the police enforcement variable of police displacement in the last six months and current homelessness/unstable housing.

Model parameters (rates of entering and leaving each compartment) were estimated through fitting Approximate Bayesian computation (ABC) to prevalence measures from the baseline survey data on the following: (1) per cent of street-based female (cis and trans) sex workers who were homeless [64.3%, 95% confidence interval (CI) 53.0% to 74.2%], (2) per cent of street-based female sex workers experiencing recent violence from clients (71.4%, 95% CI 60.4% to 80.5%) and (3) per cent of street-based female sex workers recently displaced by police (78.6%, 95% CI 68.0% to 86.5%). Findings suggested that recent violence from clients was higher among those who were homeless [odds ratio (OR) 2.17, 95% CI 0.958 to 4.91] or had experienced recent displacement (OR 3.92, 95% CI 1.33 to 11.51) and among those who had experienced displacement and were homeless (OR 3.80, 95% CI 1.65 to 8.76).

To calculate the population attributable fraction (PAF) of homelessness or displacement (i.e. proportion of violence attributable to each), we set the parameter of transitions to homelessness and displacement, respectively, to 0. We also evaluated the effect of setting both parameters to 0. We then compared each scenario to the baseline model to calculate the change in the person-time spent in the 'recent violence' category over 5 years from the time of the parameter change. To do this, we compared the area under the curve of the number of individuals in the recent violence compartments under each of the scenarios to baseline, over a period of 5 years from the parameter change.

The model was also used to evaluate the impact of reducing homelessness or police displacement to estimate the proportional reduction in experiences of violence that would result. This was calculated by comparing the proportion of modelled sex workers in recent violence categories at model equilibrium before and after implementing the relevant intervention-related parameter change.

Routine data (component D)

We set out to collate routine data to parameterise the mathematical model, define measures of enforcement for use in the questionnaire and monitor changes in enforcement in study boroughs over time.

Data sharing requests for depersonalised data relating to sex work-related offences or ASB (inclusive of criminal behaviour orders, community protection notices, civil injunctions and dispersal orders, which replaced anti-social behaviour orders in 2014) were submitted to police but were not authorised or actioned over the course of the project, despite support from senior officers. We had requested data from the crime reporting information system (on any sex work-related arrests, cautions, charges, fines or seizure of money), the stop and search (SAS) database (on SAS of sex workers for any reason) and the criminal justice team (including on criminal behaviour orders, community protection notices, dispersal orders and injunctions issued to sex workers). Because our request was not actioned, we used publicly available data on police enforcement from DATA.POLICE.UK (URL: https://data.police.uk/) on reported drug-related crimes, ASB and SAS in the study area. The repository includes street-level crime, including ASB and SAS data from forces across England and Wales. ASB data are available monthly between December 2017 and November 2020. Limitations of the data include imperfect location accuracy and some duplication of certain types of ASB, and in some cases criminalised activities/behaviours may be reclassified over the course of their processing. The police database holder maintains a list of issues related to the data through which to assess limitations (i.e. a changelog). SAS data are reported monthly from 2014 onwards. GIS locations are anonymised by replacing the co-ordinates with that of the nearest map point.

The objectives of the analyses presented here were to identify any trends in the numbers of enforcement actions against sex workers by police in Hackney, Newham and Tower Hamlets during (1) the period of the research and (2) the first lockdown period of the COVID-19 pandemic. This information was used in modelling analyses to measure a plausible estimate of change in the level of enforcement.[53] Here we outline the type of data collected for these analyses and how it was aggregated to reflect enforcement against sex workers in our study boroughs.

Data on crimes/criminalised activities and anti-social behaviour as recorded by police

Data on offences recorded by police officers (recorded offences) are GIS located but are not broken down by gender. Each offence is recorded within a specific lower super output area (LSOA) as registered by the Office for National Statistics (ONS). In addition, the approximate location for the offence is recorded, both as a GIS co-ordinate of the approximate road location for the offence to the nearest map point and as a written text location that describes the approximate road location to the nearest map point. Nearest map points are assumed to be a reasonable approximator of the offence location. Each month, the status (outcome data) of each offence is recorded in the data, with categories including initial recording, arrest, charging and court outcomes. A unique anonymised reference ID ('crime ID') is used to identify each offence through its outcomes, based on the forces' own reference numbers for specific criminalised activities. Each update in the system for each criminalised activity is also recorded in date format. No data on gender or ethnicity of the alleged 'offender' are recorded. Each offence is recorded as a particular 'crime type' from one of 15 broad categories.[66] No offences specific to sex work legislation (e.g. soliciting) are recorded; these are categorised as 'other crime' and cannot be distinguished. Therefore, recorded offences for which sex workers are most often enforced against were identified based on qualitative data, co-researchers' knowledge and emerging insight during fieldwork for the cohort study. These included:

- ASB, defined as personal, environmental and 'nuisance' behaviours
- drugs, defined as offences related to possession, supply and production.

Data were deduplicated by crime ID to reduce the data sets to unique instances of specific crimes. ASB offences are not recorded with a specific crime ID; this was assumed to be because notices, orders or fines are issued on the spot for ASB rather than involving arrest, charging and court appearances. LSOAs were used to group the offences into specific boroughs and data filtered to the three study boroughs. To identify offences representative of enforcement against sex workers, data on crimes were also analysed to the area in the borough most known for sex work on the street (termed the 'beat', mapped through TLS mapping described in the cohort study methodologies) by using the written text location for a corresponding GIS co-ordinate. Monthly crimes were summed for the beat in each borough and then

summed across all three boroughs. In addition, we estimated the change in the level of enforcement during COVID-related lockdown by summing ASB reports across all three boroughs and comparing levels between March and July 2020 with the average over 5 years from 2015–19.

Stop and search data

Stop and search data contain information on each SAS interaction, including the GIS co-ordinate and LSOA, gender, ethnicity and age group of the individual and the date, time and reason for the stop. Reverse geocoding using the R package (The R Foundation for Statistical Computing, Vienna, Austria) tmaptools was utilised to code the GIS co-ordinates as roads. These roads were then used to identify known areas for sex workers working on the streets (i.e. beats). Once identified, monthly SAS data for women only (identified using the gender variable) stopped and searched on the beats were summed across the three boroughs and by crime type. Drug offences were evaluated in beat areas only, based on qualitative evidence and co-researcher knowledge and our observations that drug stops often occur when sex workers are working.

Data were inspected visually for any noticeable trends and then a breakpoint analysis was conducted to fit two rates of change of SAS reports during the available data period (June 2016–July 2020). The average number of offences recorded before and after the change were compared to produce a percentage change in the number of enforcements recorded each month.

Results

Qualitative study

We report on the main findings of the qualitative study in the published article,[31] where we analyse how participants' encounters with police, local authorities, immigration and health and social care services affected their safety, health and broader social justice. We examine these encounters as assemblages of diverse agencies variously operating in conjunction and in tension in the context of austerity politics, laws criminalising prostitution, drugs and immigration, broader structural discrimination and gentrification. Here we provide an overview of how participants described their experiences of enforcement and summarise the key themes presented in the qualitative study article.[31]

Participants described highly varied enforcement targeting sex workers, clients and workplaces. Cis and trans women who met clients outdoors reported the most frequent, intense and violent policing. They described being pursued by police and local authorities and photographed by officers or van-mounted cameras without warning or consent. They described having condoms and drug use equipment confiscated, being banned from areas in which they worked and lived through prostitution- and/or ASB-related enforcement measures and being fined, arrested and detained for breaching related warnings:

> *Mostly they stop us with the camera … It's a big van with a camera on top. They come in the van and they focus the camera on us so, of course, they stop us. They take our details, everything. After that they call the court and they send a bigger van to arrest us. [Interviewer: Is that a police van or is it the council?] That's what we believe. We could never make out what's written on it.*
>
> *Woman, works primarily outdoors*

> *I can be stopped walking down the road four times in a day, name checked … If I walk from here to the shop they stop me … They don't play by the rules … I'm a known working girl … [When I wasn't working] they turned round and said to my mum's neighbour, 'You do know she's a prostitute, yeah?'*
>
> *Woman, works outdoors*

Some participants described being stopped and/or arrested when caught with clients, sometimes with no action taken against the client, and in other cases clients being arrested and women being subject

to court diversion schemes.[31] The few migrant participants working outdoors had not encountered immigration authorities while sex working. However, close connections with the criminal justice system meant that police enforcement could ultimately result in immigration detention, including for those with European Union (EU) citizenship, as happened to two participants:

> *[Two days before] my release date [from prison] … they came with a 'liable for deportation' order … I've lived here all my life … I've got a child here, I've got my family here … I've been in care under [name of London borough].*
>
> *Woman, works outdoors*

Fewer participants working indoors had experienced enforcement at work. This aligns with research demonstrating the disproportionate burden of enforcement on street sex workers.[6] However, we suspect that this also relates to difficulties recruiting participants following raids on indoor sex work premises, because of the disruptive effects of such raids. Before we were able to interview several women who we had met through outreach services, we lost contact with them after a series of police raids led to their working and living premises being closed down – a pattern also described by stakeholders supporting women who had been mis-charged with brothel-keeping and/or deported. A number of cis and trans women described intimidating 'visits' and raids by police and immigration officers where they worked and/or lived, typically under ostensible antitrafficking interventions and drug searches. Participants described these visits as closely resembling their and others' experiences of armed robbery, particularly when officers posed as clients:

> *[Immigration authorities] made an appointment with me as a client … I saw one person, but when I opened the door, I saw that bunch of people … That scared me … You even think … it's a gang, right? … I showed them my passport … They searched upstairs … I told them that I work alone.*
>
> *Woman, works indoors alone*

Women also described having funds and belongings confiscated and colleagues having been detained and deported.

Cis men and non-binary participants had not experienced enforcement while working. Yet, as for cis and trans women, the potential for this within a criminalised framework still influenced how they worked and sought justice, particularly for those who had insecure immigration status and/or used drugs at work:

> *There've been other incidences where drugs have been involved and, you know, consent has been broken or … quite grey … I wouldn't call the police, but I think often it's implicit that a sex worker would never call the police. That's generally the feeling. You wouldn't speak about it because it's understood that the police wouldn't be a first resort, they wouldn't be a last resort … especially if drugs were additionally involved. […] There are points at which … in theory I could have approached the police about crimes that had been committed against me but I didn't, and wouldn't have … just because I absolutely don't trust the police as a whole … and also because this happened … when my immigration status was being assessed. Whether or not that would have had an affect I don't know … I didn't have the most secure sort of status … even if nothing would have happened … I didn't want to risk it.*
>
> *Man, works indoors, used to work outdoors*

Enforcement restricted how safely participants could work, their income and their well-being. Funds lost through fines and confiscation meant longer working hours. Avoiding on-street local-authority and police enforcement – targeting either themselves or their clients – made it harder for women to generate income and work safely. Denisa described forgoing her own safety to avoid police detection: 'When I'm behind the fence the police don't see me but […] someone can approach me from behind and I can't see him'. Women sometimes expressed gratitude when police permitted their clients to pay them before arresting the client, relative to enforcement without payment. However, some feared recriminations from clients assuming they had 'set them up', and women were still generally issued

mandatory appointments with designated services three times in 6 months to avoid court proceedings. Migrant women described policing of indoor premises that jeopardised work and housing and left them reliant on exploitative workplaces. After police came to the flat where she was working, Anna told us that, 'going home[,] I was scared […] I can't sleep all night [so] I try again [to] work in [former venue tolerated by police where manager is violent]'. Participants without UK residency expressed ongoing fear of being deported and recalled others' deportations. The few migrants working outdoors had not encountered immigration authorities while sex working, but police enforcement could culminate in immigration detention, including for EU citizens, as happened to two participants. Prison and immigration detention uprooted participants' lives and threatened income and physical and mental health. Participants detained by immigration authorities were unable to bring possessions and money to detention facilities and received no funds on release. One participant described the stress of accepting a client's request for sex without a condom in these circumstances, which she would otherwise have refused.

In the analysis reported in the qualitative study article,[31] we drew on interview and neighbourhood walk data with sex workers and other stakeholders to develop three key themes relating to (1) binary notions of 'community' and 'vulnerability' underpinning (structurally) violent policing and injustice, (2) disciplining in and of health and social services through service conditions and cuts and (3) alternative visions of social justice grounded in lived expertise. These are summarised in *Figure 2* and explained here.

Theme 1

In the first theme, we document how enforcement not only by police but also by local and immigration authorities had profound effects on sex workers' safety, well-being and livelihoods. Most police and local-authority stakeholders framed sex work-related enforcement as protecting vulnerable women and/or maintaining community safety. However, participants described enforcement that was structurally, symbolically and at times physically violent. Cis and trans women described blaming and derogatory treatment, and some had experienced direct physical violence and sexual coercion by officers. Despite the wide-reaching effects of enforcement on participants' safety while working, income and well-being, few police and local-authority stakeholders acknowledged how enforcement contributed to sex workers' physical and economic vulnerability.

However, enforcement practices, and related attitudes among police, were far from uniform. Enforcement disproportionately targeted the most marginalised sex workers, including cis and trans women who work on the street and use drugs, migrants and women of colour. At the same time, their vulnerability to violence was widely dismissed when they tried to report it, their credibility discounted and/or the focus shifted onto how and why the sold sex. Migrants working together from shared flats described how officers had demonstrated little concern for their safety and well-being beyond whether or not they were forced to work, but had tolerated an established commercial venue with

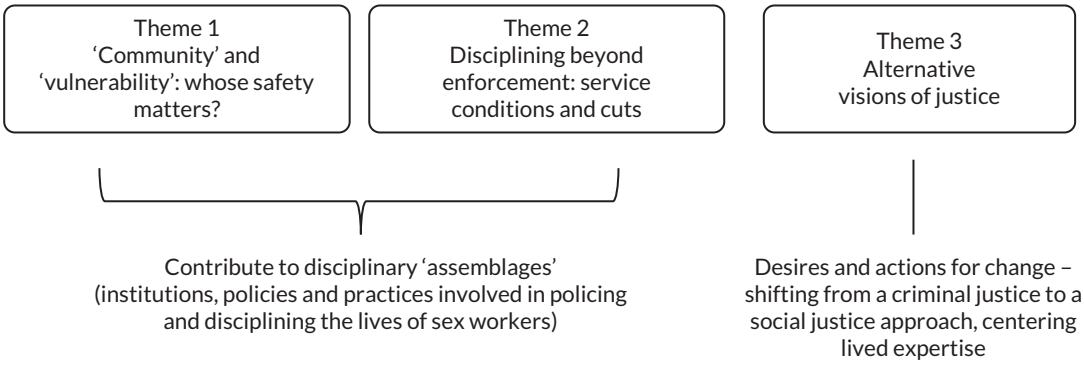

FIGURE 2 Summary and explanation of key themes derived from qualitative analysis.

violent and exploitative working conditions. Stakeholders and participants described policing grounded in frustrations, convenience, pragmatism and cynicism. Although some officers saw enforcement as necessary and inevitable, others felt that it was ineffective and served only to perform police 'strength' and control to residents. Other stakeholders variously attributed enforcement to unawareness of national policing guidance, changing personnel, local-authority priorities and gentrification.

Policing grounded in dichotomous notions of vulnerability and community functioned not to protect but to endanger and exclude highly marginalised participants in and from community spaces. Together with failures to see their vulnerabilities when they did not align with dominant visions of forced victims, this produced policing practices that worsened and dismissed these same vulnerabilities, denying sex workers justice. These practices sent a message that the safety and well-being of people who sell sex – particularly those who work on the street, use drugs and/or are migrants and/or people of colour – did not matter. They also widely overlooked the specific vulnerabilities and needs of trans women and non-binary and male sex workers.

Theme 2

In the second theme, we demonstrate how participants' experiences of disciplinary and/or conditional treatment extended to their encounters with social services, housing, drugs, health and support services. Sex workers and some other stakeholders described restrictive conditions placed on access to drug treatment, housing and mental health care that were incompatible with their lived realities, and punitive treatment when these conditions were not met. They also described hostile treatment by social services and housing. In this context, trusted, specialist services that could help navigate wider health and welfare services were vital. However, the most frequently mentioned of such services, valued for supporting sex workers to access health and social care and justice on their own terms, lost the majority of its funding for outreach to street and indoor sex work locations in the course of this research. Some stakeholders linked these funding cuts to wider austerity. Others indicated that they were driven by notions in local government that providing sex workers with legal support was antithetical to the notion that street sex workers 'threatened' community safety, and because of services' unwillingness to share information with police about their service users. Participants described newer services commissioned as 'exiting' programmes as less experienced and equipped to meet their needs on their terms, and some feared that these services would report them to police.

This deprioritising of (lived) expertise and systemic disciplining of services removed vital support not only from individuals who were unable to navigate or comply with existing service conditions but from wider communities of sex workers. This had a particular impact on the most marginalised sex workers, who also experienced the most enforcement and the least access to justice. Public health and other local authorities therefore became implicated in casting sex workers as outside safe communities, deprioritising their expressed needs and vulnerabilities and hindering possibilities to tackle health inequalities structurally under 'inclusion health' principles of social justice.

Theme 3

In the third and final theme, we synthesise the alternative visions that participants articulated in relation to service provision, community involvement and law reforms. By describing enforcement as a misplaced use of public funds that distracted from addressing sex workers' needs, and instead advocating the (re)funding of specialist sex worker support services that respect and respond to lived realities, one participant effectively argued for a shift from a criminal justice approach to one of social justice. Others highlighted the importance of peer-led services grounded in shared lived experience in relation to sex work, drug use and ethnicity. However, divisions between 'professionals' and 'communities' were reflected in a lack of opportunities for peer involvement in NHS sex worker services, services placing restrictions on communication between different groups of sex workers and the greater respect and service access afforded to sex workers when outreach workers were present. We summarise the ways in which participants communicated with other sex workers to share information, work safely, challenge bad working conditions, access services and seek justice – despite and in response to laws and other

conditions that made it difficult and dangerous to organise online and offline. Although few belonged to established/registered sex worker organisations, participants described other channels (e.g. social media groups) and ways in which they had organised with colleagues. We summarise the varied position that stakeholders adopted relative to whether or not they sought to work collaboratively with peer-led organisations. Finally, we summarise participants' perspectives on current and potential future sex work laws. Most did not mention these laws until we asked about them but broadly supported a model of decriminalisation as opposed to client criminalisation which, while preferable for some relative to their own criminalisation, was widely dismissed as a model that would continue to criminalise their income.

Cohort study

A total of 288 individuals completed baseline surveys (original baseline, *n* = 252; expanded baseline, *n* = 36). Among the sample, 91 individuals (26.5%) identified as male, of whom < 10 identified as trans men, and 197 (68%) as women or non-binary, of whom < 10 identified as trans women or non-binary. Seventy two participants (26.4%) identified as ethnically or racially minoritised, including Asian or Asian British (4.4%), Black, African, Caribbean or Black British (9.1%), mixed or multiple ethnicities (8.0%), or otherwise ethnically or racially minoritised (4.7%) including Traveller or Roma (< 10) and Middle Eastern (< 5). Overall, 123 individuals were followed up (retention 55.4%). In total 36% found clients from street settings and 64% found clients in off-street settings, including 40% working independently and advertising online, 8% working at a managed premise (e.g. massage parlour/sauna or flat) and 10% working only with regular customers. Less than one-third (28.4%) were non-UK nationals. The median age was 31 years (IQR 25–39 years) and the median duration in sex work was 6 years (IQR 3–14 years).

Key findings from the cohort study are published elsewhere,[51] where the primary analysis (objective 3) focused on cis and trans women who sell sex is presented. We also presented findings at the Fifth International Conference on Law Enforcement and Public Health.[67] In these analyses we stratified findings by working sector, comparing the experiences of cis/trans women who find clients in street-based settings to those finding clients in off-street settings (defined as flats, saunas, hotels and online). There were too few trans and non-binary participants to examine their experiences separately. For non-binary participants, we examined the gender identity they worked under (which was in all cases female or male).

We show that cis and trans women who worked on the street (*n* = 90) experience extreme levels of social exclusion. Almost two-thirds (65%) were currently homeless and over half (52%) had previously been evicted. Among those with children, 35% had had their children taken into care; all of these participants used drugs. Over two-thirds reported difficulties in paying expenses (69%) and 52% were in arrears. All these measures were lower among women working in off-street settings: 7% were currently homeless, 14% had previously been evicted and < 10 participants had had children taken into care. Financial difficulties, however, remained widely reported among cis and trans women working in off-street settings, with 27% reporting being in arrears and 53% having difficulty paying expenses. A third (33.3%) of participants had visited a sex worker support service in the past 6 months and 73.0% were registered with a GP. Just over a third (34.6%) had an unmet mental health need, meaning that they wanted mental health care but had not received it. Women who worked on the street were less likely to be registered with a GP and more likely to have an unmet mental health need. The overall prevalence of chlamydia and gonorrhoea among those tested was 11.3% and 10.4%, respectively. Chlamydia rates were higher among those working in off-street settings but gonorrhoea rates were higher among those working on the street.

The majority of our sample of cis and trans men (*n* = 76) reported finding clients in off-street settings; only 10 reported working on the street. Cis and trans men reported comparable or lower levels of social exclusion, enforcement, depression or anxiety and violence from clients, intimate partners and others than do women working in off-street settings. However, the small sample size limits the generalisability of these findings.

Findings support data from other studies and are in line with the qualitative study that shows that sex workers working on the street experience higher levels of violence. In our survey, sex workers working on the street were more vulnerable to violence (from any perpetrator) than those working in

off-street settings in relation to emotional violence (89% vs. 64%, respectively), physical violence (72% vs. 13%, respectively), sexual violence (72% vs. 34%, respectively) and any violence (94% vs. 68%, respectively). This same pattern applies when measures of violence are broken down by perpetrator. In addition, sex workers working on the street had a higher prevalence of anxiety or depression (71% vs. 35%, respectively) and experienced more police enforcement in the form of recent arrest (48% vs. < 5%, respectively), arrest of clients (32% vs. < 5, respectively) and history of imprisonment (69% vs. 5%, respectively) than those working in off-street settings. Among street-based sex workers, 87% had experienced any law enforcement in the last 6 months (including displacement from workplace, arrest for any reason, being cautioned, receiving a warning or confiscation of condoms, money, drugs or drug equipment). This compares to just 33% of women reporting their clients having been stopped, searched, arrested or detained in the same time frame, highlighting that the majority of enforcement is directed towards sex workers. It is particularly concerning that, as we show, police are key perpetrators of violence, with 42% of cis and trans women working on the street and 7% of those working in off-street settings experiencing violence by officers in the last 6 months. This was mostly in the form of verbal abuse and intimidation, damage to property, physical violence or sexual assault including rape or sex in exchange for no arrest. Key characteristics of all study participants at baseline are presented in *Table 1*.

We show that among street-based sex workers, experience of physical violence from clients in the last 6 months (54%) is comparable to levels of physical violence from other members of the community (56%). This same pattern applies to emotional violence (64% from clients, 74% from others) and rape (28% from clients, 22% from others).[67] This highlights the importance of addressing underlying drivers of violence and inequalities experienced by sex workers and cis and trans women in general. Findings also show that violence, depression and anxiety among sex workers is clearly linked to precarity in the form of homelessness, unmet access to justice, eviction and financial difficulties, and this is compounded by police enforcement practices and criminalisation, particularly for those working on the street. For example, among street-based sex workers we found that recent arrest was associated with violence from others [adjusted odds ratio (aOR) 2.77, 95% CI 1.11 to 6.94] and displacement by police was associated with client violence (aOR 4.35, 95% CI 1.36 to 13.9). Financial difficulties were also associated with client violence (aOR 4.66, 95% CI 1.64 to 13.24). Disability (aOR 3.85, 95% CI 1.49 to 9.95) and client violence (aOR 2.55, 95% CI 1.10 to 5.91) were associated with anxiety/depression. For sex workers working in off-street settings, the following factors were associated with recent physical or sexual violence from clients: financial difficulties (aOR 3.66, 95% CI 1.64 to 8.18), migration status (aOR 3.19, 95% CI1.36 to 7.49), intimate partner violence (aOR 3.77, 95% CI 1.30 to 11.0) and alcohol/drug use (aOR 3.16, 95% CI 1.25 to 7.92). Physical disability (aOR 5.83, 95% CI 2.34 to 14.51), unmet mental health needs (aOR 3.08, 95% CI 1.15 to 8.23) and past eviction (aOR 3.99, 95% CI 1.23 to 17.93) were associated with anxiety or depression. These findings are summarised in *Tables 2* and *3*.

Examining experiences of minority groups in relation to racial, ethnic or sexual identities

In addition, we conducted a secondary analysis[52] that focussed specifically on how racial and sexual identity affect police enforcement across the whole sample of cis and trans women and men (n = 288, data not shown).

A total of 274 individuals reported an ethnic/racial identity: 26.4% (n = 72) identified as an ethnically/racialised minority including Asian/Asian British (4.4%), Black/African/Caribbean/Black British (9.1%), mixed or multiple ethnicities (8.0%) or otherwise ethnically or racially minoritised (4.7%) including Traveller or Roma (< 10) and Middle Eastern (< 5). Overall 73.7% (n = 202) identified as white including British (n = 100, 36.5%), Irish (n = 8, 2.9%), or European (n = 86, 31.4%) and other or unknown (n = 8, 2.9%). Among the sample 197 (72.2%) identified as female and 76 (27.8%) as male. Within this, fewer than ten individuals overall identified as trans women, trans men or non-binary. Overall, 55% (n = 143) identified as lesbian, gay or bisexual, 92.4% among cis/trans men and 41.7% among cis/trans women. Less than a third (28.5%) were not UK nationals. The median age was 31 years (IQR 25–39) and the median duration in sex work was 6 years (3–14 years).

TABLE 1 Baseline characteristics of cohort study participants by gender and sector

Characteristic	Cis/trans women		Cis/trans men
	Off street	On street	All
Recruited at baseline	107	90	76[a]
Demographic characteristics			
Age (years), median (IQR)	30.0 (25.0–37.5)	38.0 (32.3–45.0)	26.0 (23.0–30.0)
Race/ethnicity			
Ethnically or racially minoritised (Asian, Black, mixed/multiple/other ethnicities), *n*/*N* (%)	20/105 (19)	31/88 (35)	19/74 (26)
White	85/105 (81)	57/88 (65)	55/74 (74)
Nationality status, *n*/*N* (%)			
Overseas national/refugee/asylum seeker/unknown	42/106 (40)	9/89 (10)	25/74 (34)
UK Nationality/permanent residence/ indefinite leave to remain	64/106 (60)	80/89 (90)	49/74 (66)
Sexuality, *n*/*N* (%)			
Homosexual/bisexual/gay/lesbian/ queer/other term/I do not use a term[b]	52/105 (50)	29/88 (32)	61/66 (92)
Heterosexual	53/105 (50)	59/88 (68)	5/66 (8)
Sex working characteristics, median (IQR)			
Age (years) at first sex work	24.0 (20.0–30.0)	20.0 (17.0–25.8)	21.0 (18.0–23.5)
Years in sex work	5.0 (2.0–9.0)	16.0 (7.0–23.0)	4.0 (2.0–7.0)
Number of days worked in last week	3.0 (2.0–5.0)	5.0 (2.3–7.0)	2.0 (1.0–7.5)
Working practices and safety strategies used in last 6 months, n/N (%)			
Always work alone	53/95 (56)	59/83 (71)	35/66 (53)
Always screen and refuse clients	38/95 (40)	31/83 (37)	23/61 (38)
Always work where there is CCTV	25/85 (29)	22/80 (28)	6/50 (12)
Violence by perpetrator in last 6 months, n/N (%)			
Physical/sexual violence from clients[c]	38/105 (36)	65/89 (73)	16/73 (23)
Any violence from intimate partners[d]	19/105 (18)	49/88 (56)	14/74 (19)
Any violence from other perpetrators[e]	18/104 (17)	58/87 (67)	16/73 (22)
Any police violence[f]	7/105 (7)	37/89 (42)	7/76 (9)
Health indicators, n/N (%)			
Depression and anxiety (PHQ-4; cut-off point ≥ 6) in last 2 weeks	37/107 (35)	64/90 (71)	16/71 (21)
Ever attempted suicide	25/103 (24)	49/88 (56)	18/70 (26)
Physical or mental impairment limiting daily activities in last 6 months	32/103 (31)	50/88 (57)	10/72 (14)
Alcohol use (AUDIT-C cut-off point ≥ 5)	40/105 (38)	31/89 (35)	37/71 (52)

TABLE 1 Baseline characteristics of cohort study participants by gender and sector (*continued*)

Characteristic	Cis/trans women		Cis/trans men
	Off street	On street	All
Current drug use (used recreational drugs in the last 4 weeks)	43/104 (41)	82/90 (91)	30/65 (46)
Daily crack or heroin use	< 5	66/90 (73)	< 5/65
Any STI among those testing	9/46 (20)	8/51 (17)	< 5/34
Chlamydia among those testing	8/46 (17)	< 5/51	< 5/34
Gonorrhoea among those testing	< 5/45	7/51 (14)	< 5/34
Historical police enforcement, n/N (%)			
Ever arrested	24/103 (23)	80/88 (90)	5/65 (8)
Ever been to prison	6/105 (6)	61/88 (69)	3/70 (4)
Ever detained by immigration	8/105 (8)	5/88 (6)	2/71 (3)
Recent police enforcement variables (last 6 months), n/N (%)			
Displaced from working premises/area[g]	7/106 (7)	68/88 (77)	6/75 (8)
Items confiscated by police	0 (0)	33/89 (37)	4/75 (5)
Client arrested	< 5/106	28/87 (32)	0/71
Been referred to health or social services[h]	< 5/104	14/86 (16)	< 5/66
Stopped, interviewed or detained by immigration services/officers in the UK	< 5/105	< 5/88	< 5/71
Arrested, detained or charged for any reason by UK police	< 5/103	43/87 (48)	< 5/65
Arrested/cautioned/received warning or notice (sanctioned)	6/106 (6)	62/89 (70)	< 5/72
Experienced any law enforcement[i]	10/107 (9)	78/90 (87)	11/76 (14)
How police presence in the area affected work in last 6 months, n/N (%)	***6/100 (6)***	***67/90 (74)***	
Deterred clients	< 5/101	50/89 (56)	< 5/76
Meant I had to rush negotiations with clients	< 5/101	45/89 (51)	0/76
Moved to new location/provided services away from main roads/in secluded places	< 5/101	42/89 (47)	< 3/76
Other structural determinants, n/N (%)			
Homeless[j] in last 4 weeks	7/106 (7)	58/89 (65)	10/69 (14)
Ever evicted	15/104 (14)	45/87 (52)	5/58 (9)
Child taken into care (ever)	< 5/104	30/85 (35)	0/69
In arrears (at time of survey)	36/98 (37)	39/68 (57)	29/55 (53)
Difficulty paying usual expenses (at time of survey)	57/107 (53)	66/90 (73)	41/76 (54)

continued

TABLE 1 Baseline characteristics of cohort study participants by gender and sector (*continued*)

Characteristic	Cis/trans women		Cis/trans men
	Off street	On street	All
Healthcare access in the last 6 months*, n/N *(%)			
Visited a sex worker support	36/107 (34)	43/90 (48)	12/76 (16)
GP registration	82/107 (77)	74/90 (82)	36/66 (54)
Unmet mental health need (wanted treatment but had not received it)	29/101 (29)	46/87 (53)	13/66 (20)

CCTV, closed-circuit television; GP, general practice; PHQ-4, Public Health Questionnaire-4 items.
a Among cis/trans men, only 76 were included in the analysis as 15 had incomplete behavioural data.
b Numbers in different categories across follow-up were too small to present separately without disclosure.
c Combines physical violence, hostage taking, removal of condom without consent, sexual assault, forced sexually degrading acts, rape.
d Combines abusive language, belittling or humiliating, scaring/intimidation, stalking, outing/threats to out, theft, physical violence, hostage taking, removal of condom without consent, sexual assault, forced sexually.
e Combines verbal abuse, physical violence and rape.
f Combines verbal abuse and intimidation from police, and police damage to property, physical violence, sexual assault from police, police demanding sex in exchange for no arrest, or to avoid trouble, and rape by police officers.
g Combines displacement from area where working and raided or evicted from living or working premises.
h Referral to services by police includes mandatory service referrals to avoid arrest (court diversion schemes) and is criticised as a policy of enforced welfare.[52]
i Combines displacement, sanction (issued with caution, notice, warning by police), confiscation of valuables, drug paraphernalia or condoms, referral to services, stopped/detained/interviewed by immigration, arrest, client arrest.
j Homeless is defined as sleeping rough or living in unstable accommodation (e.g. parent's or friend's home, sheltered or homeless accommodation).

Note
< 5 refers to categories with fewer than five individuals that cannot be combined. Denominators do not always sum to total because of missing data.

This analysis adjusted for key confounders associated with both racial identity and enforcement including location of sex work (on vs. off street), duration in sex work, current drug use, gender and sexual identity and migration status. Overall, 18.6% of participants had been arrested in the last 6 months and 26.5% had ever been in prison. Across virtually all measures of enforcement, proportionally more ethnically and racially minoritised people had been exposed to enforcement than their white counterparts. This can partly be explained by the higher representation of ethnically and racially minoritised people working on the street: proportionally, more ethnically/racially minoritized sex workers worked in street-based settings ($n = 37$, 51.4%) compared to white-identifying sex workers ($n = 62$, 30.7%). However, in adjusted analyses, the odds of having been recently arrested remained significantly higher among ethnically and racially minoritised participants than among white participants (aOR 2.76, 95% CI 1.31 to 5.82), after accounting for sector of work as well as other confounders. The odds of past experience of prison also remained higher among ethnically and racially minoritised participants than among white participants (aOR 2.29, 95% CI 1.05 to 5.01).

The higher representation of ethnically and racially minoritised sex workers working on the street supports other research that shows racial disparities in work setting, with sex workers of colour more likely to work in lower-paid settings.[68] Ethnically and racially minoritised participants had increased odds of experiencing recent emotional violence (aOR 2.14, 95% CI 1.02 to 4.51), as did sex workers who had experienced any kind of recent law enforcement (aOR 4.99, 95% CI 1.89 to 13.17).

A large proportion of our sample identified as lesbian, gay or bisexual (LGB): 41.7% of cis/trans women and 92.4% of cis/trans men. This is a far higher representation than among women and men recruited through household surveys in England and Wales (2.4% among women, 2.5% among men) and, with respect to cis and trans women, twice as high as a comparable sample of female sex workers working on

TABLE 2 Unadjusted and adjusted associations with recent violence across a range of perpetrators, reported by sex workers working on the street

	Physical or sexual violence from clients		Any violence from others		Depression/anxiety (cut-off point > 5)	
Variable	**GEE OR (95% CI)**	**GEE aOR (95% CI)**	**GEE OR (95% CI)**	**GEE aOR (95% CI)**	**GEE OR (95% CI)**	**GEE aOR (95% CI)**
Individual/partnership-level factors						
Ethnically or racially minoritised (vs. white)	0.62 (0.26 to 1.49)	–	1.02 (0.45 to 2.33)	–	0.60 (0.25 to 1.48)	–
Lesbian, gay or bisexual (vs. heterosexual)	1.73 (0.67 to 4.49)	–	1.20 (0.49 to 2.97)	–	2.82 (1.14 to 6.96)	3.55 (1.30 to 9.71)
Unstable[a] residency status (vs. permanent/UK resident)	0.70 (0.17 to 2.92)	–	0.68 (0.16 to 2.79)	–	0.77 (0.18 to 3.33)	–
Primary or secondary (vs. further) education	1.17 (0.54 to 2.50)	–	0.86 (0.40 to 1.85)	–	1.30 (0.53 to 3.16)	–
Partner supplies drugs	1.12 (0.48 to 2.60)	–	2.11 (0.94 to 4.72)			
Daily crack or heroin use	1.56 (0.66 to 3.69)	1.18 (0.41 to 3.43)	2.18 (0.91 to 5.21)	2.78 (0.91 to 8.55)	1.40 (0.51 to 3.83)	0.68 (0.22 to 2.06)
Any intimate partner violence (in last 6 months)	2.12 (0.91 to 4.96)	–	2.87 (1.35 to 6.11)	4.00 (1.64 to 9.72)	–	–
Physical/sexual violence from clients (in last 6 months)	Not included		2.80 (1.16 to 6.80)	–	2.30 (1.18 to 4.48)	2.55 (1.10 to 5.91)
Limited/severely limited by disability (vs. none)	Not included[b]		Not included[b]		3.21 (1.52 to 6.78)	3.85 (1.49 to 9.95)
Work-related factors						
Provides services in vehicles	2.93 (1.19 to 7.20)	–	Not included[b]		Not included[b]	
Duration in sex work ≥ 15 years[c]	0.61 (0.26 to 1.41)	0.43 (0.16 to 1.15)	0.89 (0.42 to 1.88)	1.02 (0.41 to 2.53)	0.77 (0.37 to 1.62)	0.73 (0.28 to 1.88)
Number of days worked in the last week > 5	4.55 (1.89 to 10.97)	3.04 (1.16 to 7.96)	1.23 (0.57 to 2.67)	–	Not included[b]	
Always work alone	0.93 (0.35 to 2.42)	–	Not included[b]		0.87 (0.41 to 1.85)	–
Always work in areas where there is CCTV	0.99 (0.36 to 2.77)	–	Not included[b]		Not included[b]	
Always screen and refuse clients	1.12 (0.51 to 2.42)	–	Not included[b]		Not included[b]	
Always work in well-lit areas	0.89 (0.34 to 2.35)	–	Not included[b]		Not included[b]	
Structural variables: law enforcement[d]						
Displaced from area by police in last 6 months	5.24 (2.18 to 12.6)	4.35 (1.36 to 13.90)				
Arrest for any reason (in last 6 months)			2.72 (1.18 to 6.27)	2.77 (1.11 to 6.94)		
Denied access to justice[e]					2.91 (1.23 to 6.86)	1.95 (0.74 to 5.15)

continued

TABLE 2 Baseline characteristics of cohort study participants by gender and sector (cis/trans women only) (*continued*)

Variable	Physical or sexual violence from clients		Any violence from others		Depression/anxiety (cut-off point > 5)	
	GEE OR (95% CI)	GEE aOR (95% CI)	GEE OR (95% CI)	GEE aOR (95% CI)	GEE OR (95% CI)	GEE aOR (95% CI)
Structural variables: other						
Homeless in the last 4 weeks[f]	2.75 (1.32 to 5.71)	1.87 (0.74 to 4.74)	1.48 (0.70 to 3.14)	0.88 (0.36 to 2.14)	2.47 (1.05 to 5.80)	2.19 (0.81 to 5.88)
					0	
Accessed sex worker support service (in last 6 months)	2.55 (1.13 to 5.72)	3.54 (1.27 to 9.89)	1.08 (0.50 to 2.34)	–	0.83 (0.42 to 1.64)	–
Unmet mental health need (in last 6 months)	1.65 (0.69 to 3.91)	–	2.20 (1.03 to 4.68)	–	1.11 (0.62 to 2.00)	–
Difficult to pay usual expenses (at time of survey)	2.86 (1.32 to 6.23)	4.66 (1.64 to 13.24)	0.86 (0.39 to 1.87)	–	1.80 (0.88 to 3.70)	–
Sensitivity analyses[g]						
Ever experienced violence from police	3.24 (1.60 to 6.57)	3.77 (1.46 to 9.73)			1.67 (0.83 to 3.33)	–
Client arrested (in last 6 months)	2.63 (0.99 to 6.96)	3.61 (1.11 to 11.78)				
Referred to services (in last 6 months)			2.05 (0.73 to 5.73)	2.91 (1.01 to 8.37)		
Police presence deters punters[h]					2.65 (1.27 to 5.51)	2.32 (1.04 to 5.16)
Police presence causes rushed negotiations[h]					3.00 (1.41 to 6.37)	4.15 (1.84 to 9.39)

CCTV, closed-circuit television.
a Defined as overseas national/asylum seeker/unknown or illegal migration status.
b Not considered to be a potential confounder.
c Age (years) or duration of sex work were selected as a priori confounders on the basis of quasi-AIC (QIC) evaluations.
d Multivariable models adjust for one policing variable.
e Defined as not reporting an episode of violence to police or reporting violent episode but the police either arresting the sex worker or failing to take the report seriously.
f Defined as sleeping rough or living in unstable accommodation (e.g. a parent's/parents' or friend's home, sheltered or homeless accommodation).
g Sensitivity analyses tested all policing variables in separate models adjusted for the variables shown excluding other policing variables. Only those with significant effect sizes ($p < 0.05$) in adjusted analyses are displayed.
h Response to two-part question about how police activity in the last 6 months in the area affects work.

Note
En dash (–) denotes variables excluded in adjusted models not significant in adjusted models at $p < 0.05$ and not a priori confounders.

TABLE 3 Unadjusted and adjusted associations with physical/sexual violence from clients, depression and anxiety among sex workers working in off-street settings

Variable	Physical or sexual violence from clients (in last 6 months)		Depression or anxiety (cut-off point > 5)	
	GEE OR (95% CI)	GEE aOR (95% CI)	GEE OR (95% CI)	GEE aOR (95% CI)
Individual-level factors				
Age ≥ 30 years[a]	0.40 (0.19 to 0.83)	0.48 (0.21 to 1.13)	0.36 (0.18 to 0.72)	0.33 (0.13 to 0.86)
Ethnically or racially minoritised (vs. white)	1.00 (0.39 to 2.60)	–	0.65 (0.28 to 1.51)	–
Lesbian, gay or bisexual (vs. heterosexual)	1.29 (0.64 to 2.57)	–	2.03 (1.03 to 4.01)	–
Unstable[b] residency status (vs. permanent residency/ UK national)	1.67 (0.84 to 3.31)	3.19 (1.36 to 7.49)	0.41 (0.20 to 0.85)	–
Primary/secondary (vs. further) education	1.11 (0.56 to 2.18)	–	0.89 (0.49 to 1.61)	–
Alcohol or drug use[c]	2.85 (1.36 to 5.94)	3.16 (1.26 to 7.92)	2.19 (1.13 to 4.24)	2.19 (0.91 to 5.28)
Any intimate partner violence ever	3.70 (1.61 to 8.47)	3.77 (1.30 to 11.00)	2.92 (1.35 to 6.31)	–
Physical/sexual violence from clients (in last 6 months)	Not included	–	2.12 (1.18 to 3.80)	–
Limited/severely limited by disability (vs. no disability)	Not included[d]	–	6.86 (3.28 to 14.37)	5.83 (2.34 to 14.51)
Work-related factors				
Duration in sex work ≥ 5 years[e]	0.74 (0.38 to 1.45)	Not included[e]		
Hours worked per day > 8 hours	1.98 (1.08 to 3.63)	–	Not included[d]	–
Always work alone	0.79 (0.38 to 1.60)	–	1.12 (0.62 to 2.01)	–
Always work with CCTV	0.53 (0.26 to 1.10)	–	Not included[d]	–
Always screen and refuse clients	0.36 (0.17 to 0.76)	0.36 (0.15 to 0.87)	Not included[d]	–
Always work with security/'maid'	0.44 (0.16 to 1.21)	–	Not included[d]	–
Always check customer's phone number with a safety service	1.31 (0.56 to 3.03)	–	Not included[d]	–
Structural variables: law enforcement[e]				
Ever arrested by police	0.96 (0.46 to 2.01)	0.53 (0.19 to 1.45)	2.36 (1.29 to 4.32)	–
Ever had items confiscated	–	–	7.35 (2.02 to 26.81)	4.59 (0.99 to 21.20)
Structural variables: other				
Homeless[f] in the last 4 weeks	1.75 (0.71 to 4.32)	–	2.53 (1.00 to 6.39)	–
Accessed sex worker support service (in last 6 months)	0.84 (0.40 to 1.84)	–	1.23 (0.69 to 2.19)	–

continued

TABLE 3 Unadjusted and adjusted associations with physical/sexual violence from clients, depression and anxiety among sex workers working in off-street settings (*continued*)

Variable	Physical or sexual violence from clients (in last 6 months)		Depression or anxiety (cut-off point > 5)	
	GEE OR (95% CI)	GEE aOR (95% CI)	GEE OR (95% CI)	GEE aOR (95% CI)
Unmet mental health need (in last 6 months)	1.66 (0.81 to 3.39)	–	5.99 (2.61 to 13.72)	3.08 (1.15 to 8.23)
In arrears (at time of survey)	1.38 (0.68 to 2.79)	–	2.12 (1.23 to 3.67)	–
Difficulty paying usual expenses	3.14 (1.50 to 6.58)	3.66 (1.64 to 8.18)	2.52 (1.29 to 4.93)	–
Ever evicted	Not included[d]		3.66 (1.48 to 9.05)	3.99 (1.23 to 12.92)
Sensitivity analyses[g]				
Ever detained by immigration officers			2.22 (0.75 to 6.60)	5.06 (1.43 to 17.93)

CCTV, closed-circuit television.
a Age (years) or duration of sex work were selected as a priori confounders on the basis of quasi-AIC (QIC) evaluations.
b Defined as overseas national/asylum seeker/unknown or illegal migration status.
c Alcohol use or drug use defined as an AUDIT-C score of ≥ 5 (indicating increasing risk) or used drugs in the last month.
d Not considered to be a potential confounder.
e Multivariable models adjust for one policing variable.
f Defined as sleeping rough or living in unstable accommodation (e.g. a parent's/parents' or friend's home, sheltered or homeless accommodation).
g Sensitivity analyses tested all policing variables in separate models adjusted for the variables shown excluding other policing variables. Only those with significant effect sizes ($p < 0.05$) in adjusted analyses are presented. In addition, we conducted a secondary analysis[52] that focused specifically on how racial and sexual identity affect police enforcement across the whole sample of cis and trans women and men ($n = 288$). A total of 26% of the sample identified as ethnically or racially minoritised including Asian/Asian British (4.4%), Black/African/Caribbean/Black British (9.1%), mixed or multiple ethnicities (8.0%) or other ethnicities (4.4%). Overall, 54.8% identified as lesbian, gay, homosexual or bisexual, 92.4% among cis/trans men and 41.7% among cis/trans women. Less than one-third (28.4%) were not UK nationals. The median age was 31 years (IQR 25–39 years) and the median duration in sex work was 6 years, (IQR 3–14 years).

Note
En dash (–) denotes variables excluded in adjusted models not significant in adjusted models at $p < 0.05$ and not a priori confounders.

the street and in indoor settings in Canada (18.6%).[69,70] Identifying as LGB was associated with increased odds of being raped by any perpetrator (aOR 2.37, 95% CI 1.07 to 5.24) and depression/anxiety (aOR 2.78, 95% CI 1.61 to 4.79). There was also some evidence of increased risk of emotional violence (aOR 1.96, 95% CI 0.97 to 3.94) associated with identifying as LGB. We were unable to look at the effect of trans and gender-minority identity on police enforcement practices and emotional or sexual violence, due to the small number of participants identifying as trans or non-binary (< 10).

We conclude that these findings add to the growing body of evidence that suggests harmful effects of criminalisation on sex workers' experience of violence. They also provide evidence for the link between institutionalised racism, homophobia and increased social exclusion. Although it was not possible to look at the specific effects of transphobia because of the small sample of trans sex workers recruited, previous research documents its harmful effects and the intensive policing of trans sex workers.[13,14]

Mathematical modelling

We found that, over 5 years, ending police displacement of sex workers working on the street would lead to a 35% [95% credible interval (CrI) 17% to 67%] reduction in violence. If homelessness is ended, the reduction in violence is 24% (95% CrI 9% to 37%), and if both police displacement and homelessness are ended the reduction in violence is 56% (95% CrI 44% to 65%) (*Figure 3*).[53]

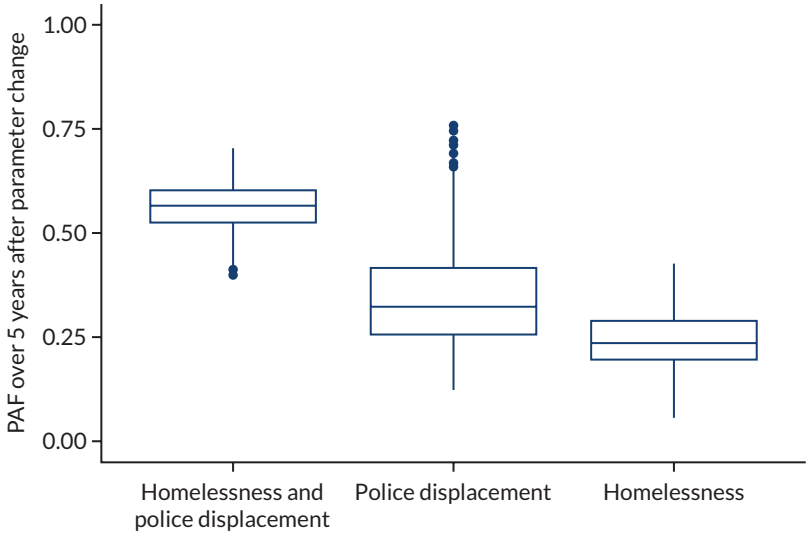

FIGURE 3 Population attributable fraction (PAF) of violence attributable to each variable over 5 years after turning off homelessness, police displacement or both within the mathematical model. The box and whiskers plots are standard Tukey-style box plots showing the median (horizontal line); the top and bottom of each box show the first and third quantiles of the data, the whiskers extend to the largest or smallest value within 1.5 times the IQR that lies above the 75th or below the 25th percentile and the dots show all outlier points outside these ranges.

Overall, the proportion of attributable violence (i.e. of violence attributable to each factor) was higher for police displacement than for homelessness, and removing both together was slightly less than the sum of removing each individually. Changes in the rate of housing and policing also affected the prevalence of violence in the population. The impact was non-linear, with an initially gradual decline in violence with reduction in policing or homelessness and a steeper decline when policing or homelessness parameters were reduced by > 50%. For example, although removing police displacement entirely led to a 38% (95% CrI 20% to 81%) reduction from baseline, reducing displacement by 39% reduced violence by only 3% (95% CrI 2% to 6%) from baseline. Increasing the rate at which those with unstable housing are housed to match the success of a 'Housing First' intervention led to a 5% (95% CrI 2% to 11%) reduction in violence.[71] When both interventions were combined (i.e. reduced but not ceased police displacement, plus housing rate equivalent to 'Housing First'), the impact increased with a synergistic effect to a 10% (95% CrI 6% to 18%) reduction in violence. These are summarised in *Table 4*.

Routine data

In summary, the analyses of the routine data suggested that stop and search (SAS) related to drug offences has steadily increased over the past 5 years in local areas where street sex work is conducted (*Figure 4*). There was no change in the use of enforcement against activities categorised as ASB (see *Figure 4*) or drug offences (*Figure 5*) across the three boroughs during the study. However, we saw a sharp increase in both of these measures during the first COVID-19 pandemic lockdown period (February–July 2020). For drug-related offences, this increase is not seen when beat areas are examined specifically, whereas for ASB a greater increase was seen in beat areas than borough wide. The routine data suggest that enforcement against sex workers remains high and there is some evidence that it has increased, particularly in the context of COVID-19 lockdown measures.

Activities categorised as anti-social behaviour

An average of 2620 ASB offences were recorded per month across all three boroughs during 2015–19. The average number of ASB offences recorded during 2020 in the whole study area was 5197 per month, double that of the previous period, reaching a maximum of 9127 in April 2020. In the beat areas only, the average number of of recorded ASB offences was 22 in 2015–19, increasing to 54 in 2020 (an increase of 2.5 times). *Figure 2* summarises all ASB reports in the beat areas and overall across the three study boroughs over this time period.

TABLE 4 Impact of modelled interventions on proportion of population experiencing client-perpetrated violence

Description	Parameter change	Percentage experiencing recent violence at equilibrium	Percentage reduction from baseline
Remove homelessness entirely	$\beta I = 0$	52 (35–66)	30 (14–51)
Cease all police displacement	$\eta I = 0$	46 (13–64)	38 (20–81)
Remove homelessness and cease all police displacement	$\beta I = 0$; $\eta I = 0$	22 (11–35)	71 (55–83)
Additional housing rate as seen in Housing First[20]	$\alpha_{I=}\alpha_B + 1.8$	71 (59–79)	5 (2–11)
Reduce police displacement rate by 39%	$\eta I = 0.61\,\eta B$	73 (61–81)	3 (2–6)
Additional housing and reduced policing together	$\alpha_{I=}\alpha_B + 1.8$; $\eta I = 0.61\,\eta B$	68 (54–76)	10 (6–18)
Remove difference in policing between homeless and not homeless	$\theta I = 1$	63 (44–75)	15 (5–35)

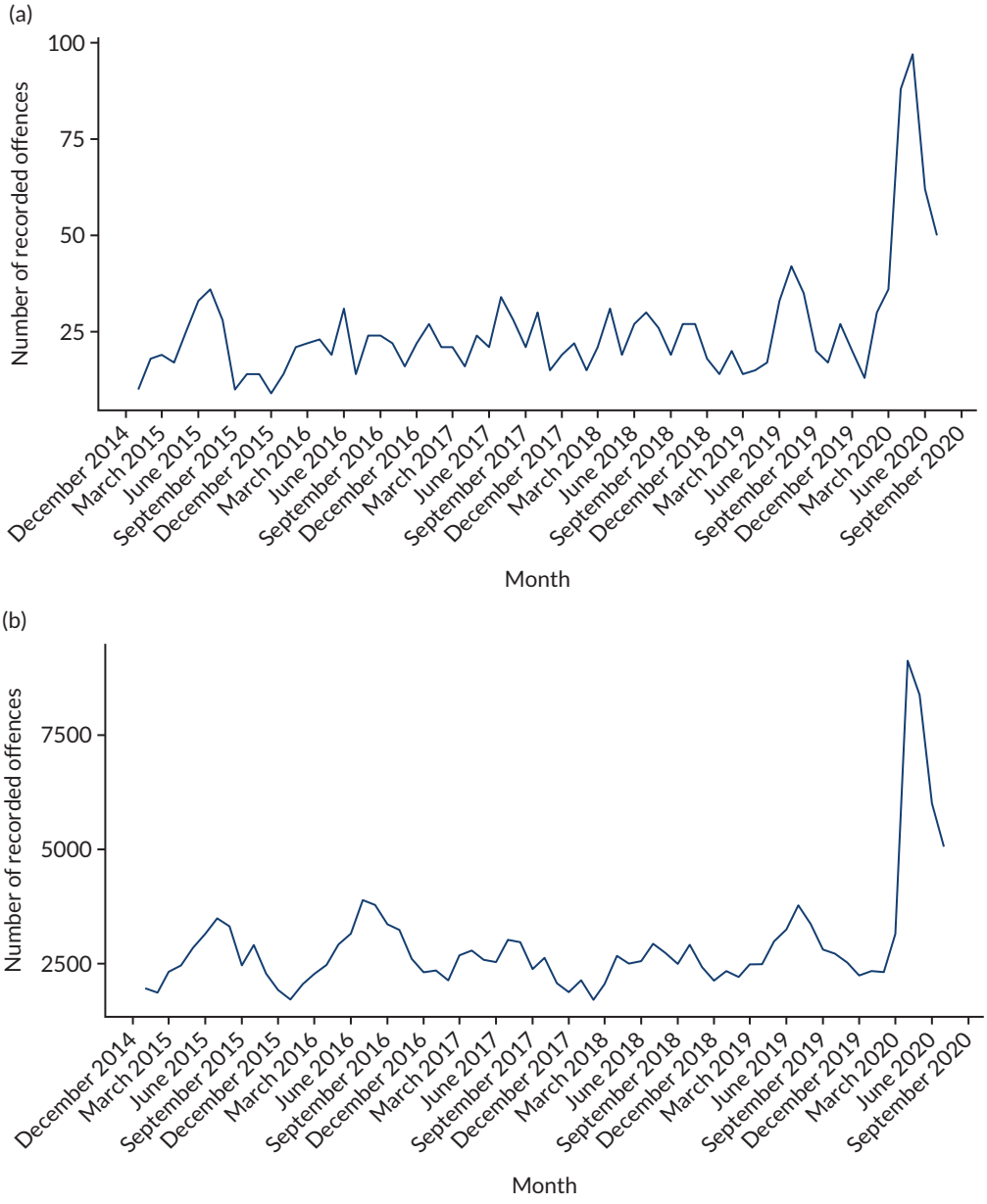

FIGURE 4 Enforcement through the use of anti-social behaviour (ASB) measures (all genders) in (a) beat (street sex work) areas only and (b) overall in Hackney, Newham and Tower Hamlets.

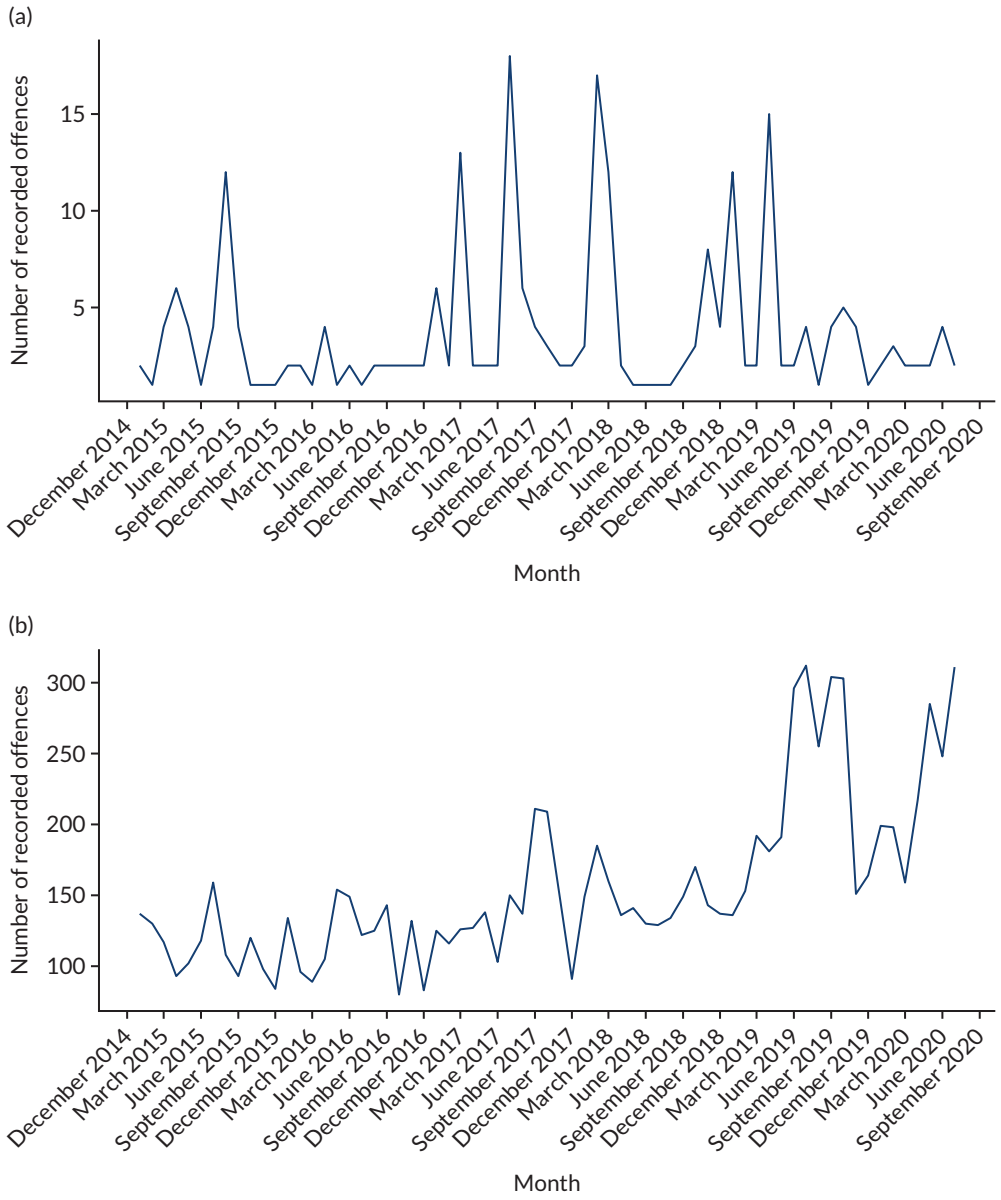

FIGURE 5 Enforcement for drug offences (all genders) in (a) beat areas only and (b) overall in Hackney, Newham, and Tower Hamlets.

Drug offences

The mean number of drug-related offences recorded per month in 2015–19 was 148, and during 2020 this increased to 231. However, we can see across the three boroughs that drug offence records increased in mid-2019, whereas there is no increase in drug-related recorded offences in the beat areas specifically, and possibly a decrease, although numbers reported in the beat areas are small overall (see *Figure 5*).

Stop and search related to drug offences

SAS related to controlled drugs increased from 0.63 stops per month between 2016 and 2017 to 4.5 per month from February 2018 to 2020. This was against women and is limited to SAS for suspected drug-related activities, which is closely aligned with the type of enforcement that female sex workers who work on the street experience. The breakpoint analysis fitted a slope of 0.75 events per month up to June 2018, which increased to 4.6 events per month for the remainder of the data period. If the rate of increase in SAS had remained stable in 2018, the total number of SAS would have been 39% lower at the mid-point of the cohort study. *Figure 6* summarises enforcement related to SAS against women in all three boroughs.

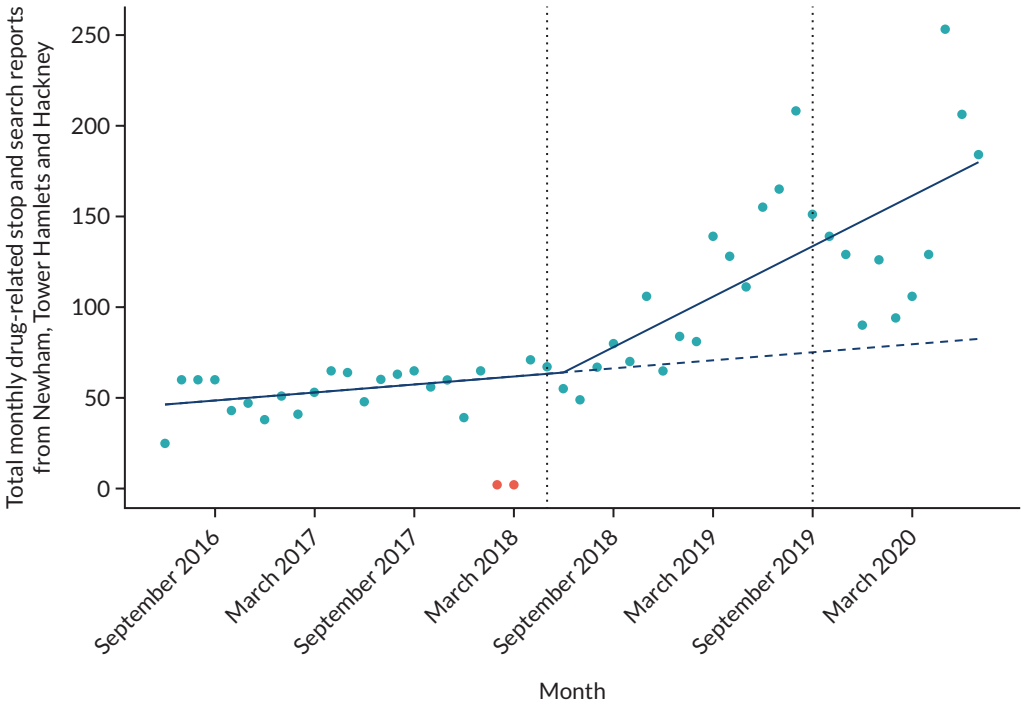

FIGURE 6 Stop and search against women related to controlled drugs in Hackney, Newham and Tower Hamlets. The solid line shows the breakpoint analysis linear regression; the dashed line shows the forward projection of the line prior to the breakpoint; horizontal dotted lines represent the start and end dates of the East London Project cohort data collection. Orange dots are two outlier points that were excluded from the breakpoint regression.

Changes to protocol

Key changes to the protocol responded to the changing context of policing and specialist service provision in the study boroughs. As discussed in the *Introduction*, because of changes in policing and wider policies and practices across the study boroughs,[31] we were unable to examine the implementation of non-enforcement approaches in action. However, given that we were not attempting to look at area-level differences, these changes did not prevent us from assessing how natural diversity in policing practices affects sex workers' health and safety, both quantitatively and qualitatively. As described in the qualitative article,[31] enforcement practices varied over time, between areas and spaces, and based on participants' identities and lived experiences, involving a far wider array of agencies than police.

The contextual change with the most significant impact on the study was the extensive defunding of the specialist sex worker health and support service with which we collaborated on this research. As outlined in the *Introduction*, prior to and during fieldwork the service lost its funding for street outreach in two boroughs and for indoor premises outreach in all three. This affected both recruitment opportunities and our abilities to achieve objective 4 (i.e. to assess how the presence of an outreach service affected enforcement). Nevertheless, we were able to generate in-depth qualitative data that demonstrated how the reduction and removal of such a service (1) compromised sex workers' safety, health, access to services and broader social justice and (2) was closely connected to the wider environment of criminalisation and enforcement against sex workers, their clients and their workplaces.[31]

We made some changes in relation to the cohort study. First, we broadened our eligibility criteria for sex workers in off-street settings to include those working London-wide rather than people working specifically in the boroughs. This was deemed necessary to counter slow recruitment of participants working in off-street settings and is comparable to open cohort methods used in sex work research in other settings.[57] This was justified with input from co-researchers with lived experience of sex work

and grounded in data collected from participants, on the basis that many indoor sex workers are more mobile than those working on the street. Second, we lengthened baseline recruitment for sex workers working on the street to include expanded recruitment of new participants at follow-up.

The low uptake of testing precluded the modelling of HIV/STI data in the mathematical model (objective 6). Given that our primary outcome for the cohort study was self-reported violence, testing for STIs was provided on a voluntary basis. However, uptake of STI testing was low, with just over half of cohort study participants ($n = 133/255$) consenting to testing or linkage. The modelling analysis was also limited by the small sample size of the quantitative data set and by high rates of correlation between different factors associated with higher risk of experiencing violence, such as near-universal drug use in sex workers working on the street. As a result, we focused our study on key drivers of violence determined by the qualitative and cohort studies to identify a question that could be parameterised and modelled. The modelling analysis was therefore reduced compared with the original proposal. The model relies on data to make the most accurate predictions possible, and the original proposal was extremely ambitious in terms of being able to draw inferences about so many outcomes in one model. Because of the limited sample size, high rates of correlation between factors such as drug use and homelessness and number of outcomes (such as violence from different perpetrators; physical, sexual and emotional violence; and mental ill-health), it was not possible to address all questions of interest.

Lessons learned

The strengths and limitations of the individual components of this research are considered in each of the published articles.[31,51–53] It was ambitious to attempt to recruit such a diverse sample of sex workers across street and off-street settings. In the case of the cohort study, this necessitated a lengthy process of mapping to produce a sampling frame. It also required an extensive questionnaire to ensure that we captured the very different working environments, practices, types of violence and enforcement that are experienced and to characterise the different settings for sex workers of all genders. We had estimated a follow-up rate of 80% but achieved only 50% follow-up. This significant reduction is due in part to the removal of our key collaborators' outreach services across the study boroughs, which considerably reduced our ability to maintain contact with participants. In the case of the qualitative study, the diversity of the sample limited the extent to which we could explore in-depth experiences in specific sex work sectors or by gender. As discussed above, enforcement activities (such as raids on indoor premises) also made it harder to maintain contact with potential participants.

We decided not to differentiate between cis and trans participants' quotations in the qualitative study to protect against deductive identifiability of the small number of trans participants in the study This limited the extent to which we could highlight the specific experiences of each community. Previous research demonstrates that trans women in particular experience intense enforcement and violence.[13,14] Nevertheless, our approach did allow us to document the varied and targeted ways in which other marginalised groups of sex workers are policed, by race/ethnicity, sector and by gender, including at intersections with poverty, drug use and (im)migration.[31,52] The fact that we struggled to recruit trans participants into both the cohort and the qualitative study is probably at least partly linked to the intense enforcement and related transphobia experienced by this community. A higher number of trans and non-binary (co-)researchers may also have help to better represent these communities in the research.

Allocating a longer period (and commensurate resources) to ethnographic fieldwork at the outset of the qualitative study would have provided greater opportunities to develop relationships with a wider diversity of sex-working communities in the boroughs. This may have afforded us greater success in interviewing groups of sex workers under-represented in this research and other adults working in the sex industry (see *Methods*). Because of the time required to recruit participants into the study, there was less scope than intended to conduct preliminary analyses of qualitative data prior to the development

of the cohort study questionnaire. Nevertheless, we were able to use early insights from the qualitative work to inform questionnaire development. Furthermore, the close working relationships between the qualitative and cohort study teams during data collection and analysis, with one co-researcher being a member of both teams, allowed these components of the study to feed into each other throughout the research.

Despite the low uptake of STI testing, the inclusion of biological data was important to provide further measures of vulnerability that are less prone to misclassification bias than self-reported data and potentially more persuasive to policy-makers and service providers. We had anticipated that many participants would not be in contact with sex worker support services or GUM clinics, so the provision of diagnostic testing met an immediate need. Researchers should work with communities/sex workers to establish what health/social services might be beneficial to include with the research (e.g. condoms, HIV/STI testing, referrals to sex worker-friendly mental health and social support/welfare services) depending on health needs and relevance to the research.

The relatively small sample size recruited into the cohort study and our inability to recruit a probabilistic sample, despite extensive attempts, limits the ability to generalise findings beyond those working in the study boroughs. This particularly relates to trans men and women and non-binary participants, of whom only a small sample were recruited. Generalisability to other areas is further restricted by the highly urban and ethnically diverse nature of the study boroughs, limiting comparability to similar urbanised areas. The small numbers of off-street sex workers reporting enforcement in the cohort study probably reflects difficulties in recruiting people working in shared premises who had experienced raids or displacement by police and impedes our understanding of how they are policed. The sample size also limited the type of analyses conducted in the mathematical modelling. In addition, the structure of the model necessitated a focus on violence from just one group of actors and one type of police enforcement, which is not representative of the breadth of violence experienced by sex workers (including from police themselves), the intensive and varied types of enforcement or the other aspects of exclusion experienced by this highly diverse and marginalised population. There is a risk that findings from the mathematical modelling focus attention on client-based violence supporting narratives that sex work is inherently violence and detracting attention away from other perpetrators.[72] However, the cohort and qualitative study clearly show the extent to which some communities of sex workers experience violence across all aspects of their lives, from police, residents, neighbours and intimate partners. They also demonstrate how policing practices render sex workers more vulnerable to violence by disrupting safety strategies and failing to protect sex workers and respond appropriately to reports of violence against them. Given the limitations inherent in the methods we employed, and the limitations of our data collection, it is important that the findings are considered together.

Discussion

Taking the findings of our study components together, our research supports international evidence of the profound harms of criminalisation and enforcement, particularly for sex workers who already experience the greatest structural discrimination and exclusion.[6] In the qualitative analysis[31] we document how enforcement, safety and service access were not separate processes but connected, constituent parts of a broader assemblage of disciplining and criminalisation. We document how police, local-authority and immigration enforcement that worked to drive sex workers out of 'community' spaces disrupted their safety strategies and access to outreach services, exacerbated existing financial pressures and marginalisation, and sometimes involved direct attacks by officers. These findings are supported by our cohort study that shows extreme inequalities in relation to physical, sexual and emotional violence, mental health and enforcement, among sex workers working on the street. We show that not only the safety but also the mental health of sex workers are affected by entrenched poverty and police enforcement practices and that police are key perpetrators of violence against this community.[51] Financial difficulties contributed to client violence among sex workers in all sectors and, along with unstable housing in the form of past eviction, contributed to anxiety and depression among

sex workers working indoors. The fact that we did not detect associations between homelessness and recent violence from any perpetrator against street-based sex workers – contrary to evidence from elsewhere[3] – might be due to the broader definition of homelessness that we used (encompassing unstable accommodation and not solely sleeping on the street). The qualitative findings demonstrate that cis and trans women who worked on the street, used drugs, were migrants and/or ethnically and racially minoritised were particularly targeted for enforcement and their vulnerabilities to violence were discounted. Meanwhile, the survey evidenced disproportionate arrest and imprisonment of ethnically and racially minoritised sex workers and their greater representation in lower-paid, street-based settings.[52] These findings, alongside growing international evidence, point to the roles of institutional racism, xenophobia, misogyny, transphobia and classism in sex-work related enforcement and denials of justice.

Our findings, in particular the mathematical modelling, indicate that the combined cessation of police displacement and provision of housing could have a synergistic effect, highlighting the necessity of addressing multiple structural factors alongside decriminalisation to improve the health and welfare of sex workers.[53]

Findings align with research and community experiences internationally that document high levels of police violence and abuse against sex workers and highlight how sex work laws, structural inequalities and systems of oppression intersect to endanger, and deny justice and services to, sex workers.[6,52,53,73,74] Our findings provide a more complete picture of sex workers' experience of violence, highlighting the role of police and community members, which has historically been under-represented in academic research.[3] Singular focus on individual perpetrators of violence, particularly clients and pimps, and emphasis on engagement in sex work as a risk factor for violence[75] fail to recognise the 'conditions of sex work'[76] and the structural and direct violence that sex workers experience at the hands of the police and other authorities. Such approaches risk steering legal, social and health policies away from addressing the underlying determinants of violence and mental health across all aspects of their lives.[77]

We note that the high levels of client violence, homelessness, drug use and poor mental health among cohort study participants are comparable to those documented in research 10–20 years ago, with sex workers working in diverse settings across the UK.[4,15,44] Over this time period there have also been increasing levels of; a contraction of the public sector particularly affecting welfare, sexual health services, drug and alcohol treatment and specialist sex worker services; and shifted commissioning emphasis towards sex worker services that prioritise 'exiting'.[40,78] Our findings suggest that enforcement against sex workers remains high and there is some evidence that it is increasing. Our analyses of routine data suggests that police use of stop and search (SAS) related to controlled drugs has steadily increased over the last 5 years in local areas where street sex work is conducted. Although this is not directly attributed to sex work, given accounts from the qualitative study of intensive policing towards women using drugs and the high level of crack and heroin use reported, police may be targeting street-based sex workers as part of their SAS strategy.[31,51] In routine data, we did not observe any change in the use of enforcement related to ASB or recorded drug offences across the three boroughs during the study. However, we saw a sharp increase in both measures during the first COVID-19 pandemic lockdown period (February–July 2020). For recorded drug offences, this increase is not seen when street sex work areas are examined specifically, whereas for ASB a greater increase is seen in street sex work areas than overall. For SAS, the increase seen in 2020 continues the increasing trend observed in previous years. Other evidence suggest that sex workers in Newham were more heavily policed during lockdown, supporting our findings.[55] This heightened enforcement, combined with a lack of access to government financial protection schemes and reduced funding for support services, left many sex workers in research, with sex worker-led mutual aid funds stepping in to offer emergency support.[79,80]

Previously, criminologists and sociologists have argued that mandatory engagement and support orders in England – similar to court diversion schemes described here – produce 'conditional citizenship' by providing support only to those who comply with these orders.[22,81] Elsewhere, public health researchers

have demonstrated how criminalisation has restricted individual sex workers' access to existing health and social care services. In the main qualitative article,[31] we document an additional systemic disciplining whereby long-standing, trusted and experienced services that did not align with dominant approaches to sex work governance were disregarded and defunded, removing access to this service for all sex workers. The effects of this are likely to disproportionately impact the most marginalised sex workers, who rely most heavily on specialist health and support services, amid discrimination and systemic barriers in mainstream services; these groups also experience disproportionate enforcement and denied access to justice.[8,9,82] This demonstrates that local authorities' policies and practices can directly impede an 'inclusion health' approach to tackling health inequalities experienced by sex workers.

Public health studies examining the impact of criminalisation on sex workers' health have typically focused on how police enforcement disrupts safety strategies and access to health services, as we did at the outset of this study. However, as we discuss in the main qualitative article,[31] our findings demonstrate that a fuller understanding of the health effects of criminalisation requires close attention to the wider assemblages of institutions, policies and practices involved in policing and disciplining the lives of sex workers and those advocating for change. This includes critically examining the politics and discourses that shape relationships between enforcement agencies, commissioners, services and advocacy groups, and the ultimate effects this has on the kinds of services that are commissioned and promoted.

Implications and recommendations

Our research has clear implications for policy and practice, which we summarise here.

Holding police accountable

Participants' accounts of violence and harassment by police and other enforcement agencies warrant urgent, transparent action, both to hold perpetrating officers accountable and to redress the violent effects of sex work-related enforcement. The enforcement practices described in the qualitative study,[31] and the displacement from work settings and extensive enforcement reported in the cohort study,[51] contravene national police guidance[83] and wider human rights standards.

Our findings underline the urgency to review current enforcement practices, tackling stigma and decriminalising sex work to allow sex workers to work safely. This would involve multiple enforcement agencies and measures, including police, drug and immigration laws and the wide range of civil ASB laws. Our survey and qualitative findings[31] around discriminatory enforcement and in-access to justice, and officers' various frustrations depending on what they saw as their role and its (in)effectiveness, suggest that these changes will require concerted efforts to tackle institutionally discriminatory cultures and challenge dominant narratives that contemporary policing of sex work protects communities and vulnerable women.

Various existing approaches could inform this work. The North East Sex Work Forum (URL: www.neswf.co.uk)'s annual regional learning day has been a source of cultural change and improved policy and practice across the region. This involves providing training and development grounded in best practice and cutting-edge research, aimed at police, criminal justice agencies and sexual health, public health, drug services and other agencies that have contact with sex workers. Although agencies were initially resistant to sex workers' presence, the training shifted attitudes such that they became more open to, and asked for, sex worker perspectives. The forum's participatory methodologies, designed to bring people together to problem-solve and co-create change, helped to foster ownership and affect practice. Other examples include the development of a model in Merseyside to treat violence against sex workers as hate crime.[84] Training police officers to better respond to coercive control in domestic violence has improved understanding of better practices in how police respond to intimate partner and sexual violence calls. Training was conducted in collaboration with the feminist Open Clasp Theatre Company (Newcastle upon Tyne, UK), informed by research conducted by co-investigator Maggie O'Neill. This was initially conducted in Durham, UK, to 200 front-line police officers and then rolled out

to 1000 police officers in Cleveland. We urge that any such fora/training developed to respond to the recommendations in this research be co-developed and delivered with members of local sex worker communities (as was done in these examples).

Health and social care services: commissioning and redistribution of funds

Our findings support the critical need for health and support services that are respectful and understanding of the diverse lived experiences of people who sell sex at intersections of sex work, drug use, migration, racial, sexual and gender identity, and that do not discipline, punish, patronise or blame these communities. Such services must go beyond clinical and sexual health provisions, supporting mental health needs, preventing and addressing consequences of physical, sexual and emotional violence, and supporting sex workers' wider welfare and rights. Services such as National Ugly Mugs, which supports sex workers who are survivors of violence to access physical and mental health and welfare services, to report violence to the police if they wish, and provides warnings about potentially dangerous individuals and situations to reduce violence against sex workers, are essential but currently under-resourced.

Reinstatement and expansion of services that address the immediate, complex and diverse needs of sex workers, on their terms, is urgently needed. It is also vital that diverse communities of sex workers are centrally involved in the design and delivery of such services so that they reflect the varied needs and priorities of people who sell sex, and shift power dynamics and resources in line with principles of social justice, as articulated by participants in this research.[85–88] This would involve a redistribution of funds towards specialist, peer-led health and support services, grounded in recognition and representation of sex workers' diverse needs and lives.

A retrospective analysis of routine service data collected by sex worker support services would be useful to inform ongoing service development and assess the extent to which the financial cuts, and concomitant shift towards commissioning 'exiting'-focused services, has impacted sex workers' access to essential health, social, housing and drugs services. Further research into the barriers to accessing mental and other health services is also critical to understanding why mental health needs observed here and elsewhere are woefully underserved. Any future research with sex workers working on the street requires collaboration with sex worker support services (with street outreach capacity) and organisations, to support participants' health and social needs and foster a safe space in which to conduct the research. This is imperative, particularly given the dwindling resources provided for outreach to street settings and the extreme health needs of participants identified here and in other linked research.[55]

Inclusion health: acknowledging and redressing harms of enforcement and decommissioning

We recommend that 'inclusion health' commissioning guidelines clearly acknowledge the effects of criminalisation, enforcement and related decommissioning of specialist services on sex workers' safety and health, and the disproportionate effects on the most marginalised sex workers. We also urge recognition of the need for sex workers with diverse lived experiences being involved in, and have opportunities to lead, related policy and service development, implementation and evaluation, in line with broader efforts to improve public and patient involvement in health and social care.[89]

Our findings underline the urgency for social and legal policy reform around enforcement against sex workers and their clients, tackling stigma and decriminalising sex work to allow sex workers to work safely, alongside increased availability of housing, mental health and violence prevention and survivor support services, and strengthening of existing services. This is particularly imperative with the prospect of sustained economic austerity as the country addresses the short- and long-term effects of the COVID-19 pandemic. Failure to do so risks perpetuating and exacerbating the violence and other

health harms that sex workers face. We urge local authorities to consider how current enforcement and service commissioning practices, including those in the name of community safety, hinder an 'inclusion health' agenda and exacerbate the exclusion of marginalised communities, and to take action to redress these harms.

Research priorities

We identify the following future research priorities. All research should be collaborative, with central involvement of people with diverse lived experiences of sex work in the design, delivery, dissemination and steering of such studies.

- Research is needed to track and document: the effect of changes to sex work, drug and immigration laws and their enforcement, austerity, housing and the economy, on sex workers' health and welfare; and the intergenerational effects of criminalisation, discrimination and poverty. Given the prospect of increased economic austerity in response to the effects of the COVID-19 pandemic, this is imperative. Such studies would benefit from understanding enforcement, service commissioning and provision as assemblages of agencies, policies and practices that operate in conjunction and in tension to affect sex workers' safety, health and rights.
- We recommend qualitative and quantitative research to better understand trans, non-binary and gender diverse sex workers' experiences of enforcement, violence and service access, in light of our lack of success in recruiting sex workers in these communities. Any such work should examine how gender identity interacts with racial and sexual identity, migration status and sex work setting, to affect each of these experiences.
- We recommend longitudinal research to assess the effects of changes in commissioning frameworks, service design and delivery models for sex worker services, on sex workers' health and welfare. This could include research exploring how 'exiting' and sex worker-led services are funded and commissioned, and how they support people who sell sex to access vital health and support services, on whose terms, to inform the design and delivery of respectful and person-centred services in the UK and elsewhere.
- Realist-informed trials of community-based safety and support services, designed and implemented in partnership with sex worker-led organisations, would provide more rigorous evidence on effective models to protect sex workers' safety, health and rights and their interaction with structural determinants. These studies should include other urban and less urbanised areas to extend inferences that the research can make to populations of sex workers across diverse racial, ethnic, gender identities, sex work sectors and other aspects of lived experience.
- There is a need for formative qualitative research, to inform interventions to tackle multiple forms of stigma and discrimination directed towards sex workers in health and other services, and in society as a whole, and to address the needs of ethnically and racially minoritised, sexual and gender minority sex workers specifically.
- Further research into the barriers to accessing mental and other health services is critical to understanding why mental health needs observed here and elsewhere are woefully underserved.

Conclusion

In line with international research, our study provides evidence of the profound harms of criminalisation and enforcement for sex workers, particularly the most marginalised sex workers, who already experience the greatest structural discrimination and exclusion.[6] This includes sex workers who work on the street, those who use drugs, migrants, ethnically and racially minoritised, sex workers and those whose are sexual and gender minorities.

Our findings add weight to the case for decriminalising sex work as a matter of racial justice as well as one of broader health and social justice. While this is a vital first step, this will have limited benefit for

the most marginalised sex workers without tackling racism, misogyny and other discrimination in the practices and cultures of enforcement and other agencies – practices which increase social exclusion and fuel underlying social inequalities in relation to housing, poverty and access to services.

Findings show that it is imperative to address the underlying drivers of vulnerability, oppression and inequality, which shape the conditions in which sex workers live and work, and concurrently to (re)fund specialist, peer-led health and support services that respect and respond to sex workers' diverse needs and realities.

Additional information

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Contribution of authors

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Data-sharing statement

Available data can be obtained from the corresponding author and will be subject to data use agreement between the contractor and the third party requesting the data.

Ethics statement

Both studies received approval from the London School of Hygiene & Tropical Medicine (LSHTM) ethics committee (qualitative study: 13919, 16/06/2017; cohort study: 14441, 17/11/2017) and the London Stanmore research ethics committee (qualitative study: 204494, 12/06/2017; cohort study: 231206, 24/10/2017).

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List of abbreviations

aOR	adjusted odds ratio
ASB	anti-social behaviour
AUDIT-C	Alcohol Use Disorders Identification Test – Consumption
CI	confidence interval
cis	cisgender
CrI	credible interval
EU	European Union
GEE	generalised estimating equation
GIS	geographic information system
GUM	genitourinary medicine
HASC	Home Affairs Select Committee
HIV	human immunodeficiency virus
LGB	lesbian, gay, bisexual
LSHTM	London School of Hygiene & Tropical Medicine
LSOA	lower super output area
OR	odds ratio
PAF	population attributable fraction
SAS	stop and search
STI	sexually transmitted infection
trans	transgender

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Appendix 1 Definitions of emotional, physical and sexual violence used in the cohort study

Question	Composite measure	
In the last 6 months, has a client physically abused you (pushed, shoved, slapped, kicked, punched, choked, dragged or burned you, used a weapon against you, thrown something at you, beaten you up)?	Combined as any physical violence	Any physical or sexual violence from clients in last 6 months
In the last 6 months, has a client held or taken you against your will, even for a short time (taken hostage or kidnapped or abducted)?		
In the last 6 months, has a client pressured you to have sex without a condom against your will or removed a condom without consent?	Combined as any sexual violence	
In the last 6 months, has a client touched or grabbed you sexually against your will (grope) or attempted to get sex through force/threat (sex includes oral, vaginal or anal sex)?		
In the last 6 months, has a client forced you to do something sexual that you found degrading or humiliating?		
In the last 6 months, has a client forced you to have sex when you did not want to (sex includes oral, vaginal or anal sex)?		
In the last 6 months, has a client belittled or humiliated you or used abusive or insulting language towards you such as calling you inappropriate names or making racist remarks?	Any emotional violence from clients in last 6 months	
In the last 6 months, has a client done things to scare or intimidate you on purpose or threatened to hurt you or someone you care about?		
In the last 6 months, has a client made or attempted repeated unwanted contact online, by telephone or in person, including following you (stalked)?		
In the last 6 months, has a client threatened to tell others (e.g. landlord, neighbours, police, immigration, friends, family, or publish online) that you do sex work ('out' you)?		
In the last 6 months, has a client stolen or attempted to steal from you (money or possessions or drugs) or refused to pay?		

Project publication

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Policing and public health interventions into sex workers' lives: necropolitical assemblages and alternative visions of social justice

Publication

Grenfell P, Stuart R, Eastham J, Gallagher A, Elmes J, Platt L, O'Neill M. Policing and public health interventions into sex workers' lives: necropolitical assemblages and alternative visions of social justice. *Crit Public Health* 2023;**33**:282–96. https://doi.org/10.1080/09581596.2022.2096428

Abstract

While extensive literature documents how criminalisation harms sex workers' health and rights, limited research has critically examined how interactions between criminal-justice, health, and other systems shape support and justice for and by people who sell sex. We attend to this question by drawing on participatory, qualitative research with a diverse group of sex workers and other stakeholders in East London, UK. In addition to directly and structurally-violent enforcement practices, we identified wider, necropolitical assemblages and practices – across police, local and immigration authorities, health and social services – that disciplined sex workers' lives, responsibilised them for their health, and defunded specialist services grounded in lived realities, amid tensions over sex-work governance. These effects – grounded in notions of community and vulnerability that often privileged residents' concerns over threats to sex workers' safety and health – impacted marginalised and minoritised cis and trans women the most. Those who worked on the street and used drugs, were migrants, and/or women of colour were particularly targeted for enforcement, discounted when reporting violence and impacted by service cuts. Yet participants' appeals for redirection of funds from enforcement towards respectful, peer-led services reflected claims to social justice on their own terms. We recommend (re)commissioning health and support services that respond to sex workers' diverse realities, with and by them, alongside concerted efforts to end policies and practices that criminalise, punish, and blame. This would help to alleviate the health and social harms that we document, in support of inclusive participation in health and broader social justice goals.

Funding

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This article reports on one component of the research award A participatory mixed-method evaluation on how removing enforcement could affect sex workers' safety, health and access to services, in East London. For more information about this research please view the award page https://fundingawards.nihr.ac.uk/award/15/55/58.

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Effect of police enforcement and extreme social inequalities on violence and mental health among women who sell sex: findings from a cohort study in London, UK

Publication

Elmes J, Stuart R, Grenfell P, Walker J, Hill K, Hernandez P, *et al*. Effect of police enforcement and extreme social inequalities on violence and mental health among women who sell sex: findings from a cohort study in London, UK. *Sex Transm Infect* 2022;**98**:323–31. https://doi.org/10.1136/sextrans-2021-055088

Abstract

Objectives

To examine legal and social determinants of violence, anxiety/depression among sex workers.

Methods

A participatory prospective cohort study among women (inclusive of transgender) ≥18 years, selling sex in the last 3 months in London between 2018 and 2019. We used logistic generalised estimating equation models to measure associations between structural factors on recent (6 months) violence from clients or others (local residents, strangers), depression/anxiety (Patient Health Questionnaire-4).

Results

197 sex workers were recruited (96% cisgender-women; 46% street-based; 54% off-street) and 60% completed a follow-up questionnaire. Street-based sex workers experienced greater inequalities compared with off-street in relation to recent violence from clients (73% vs 36%); police (42% vs 7%); intimate partner violence (IPV) (56% vs 18%) and others (67% vs 17%), as well as homelessness (65% vs 7%) and recent law enforcement (87% vs 9%). Prevalence of any STI was 17.5% (17/97). For street-based sex workers, recent arrest was associated with violence from others (adjusted OR (aOR) 2.77; 95% CI 1.11 to 6.94) and displacement by police was associated with client violence (aOR 4.35; 95% CI 1.36 to 13.90). Financial difficulties were also associated with client violence (aOR 4.66; 95% CI 1.64 to 13.24). Disability (aOR 3.85; 95% CI 1.49 to 9.95) and client violence (aOR 2.55; 95% CI 1.10 to 5.91) were associated with anxiety/depression. For off-street sex workers, financial difficulties (aOR 3.66; 95% CI 1.64 to 8.18), unstable residency (aOR 3.19; 95% CI 1.36 to 7.49), IPV (aOR 3.77; 95% CI 1.30 to 11.00) and alcohol/drug use were associated with client violence (aOR 3.16; 95% CI 1.26 to 7.92), while always screening and refusing clients was protective (aOR 0.36; 95% CI 0.15 to 0.87). Disability (aOR 5.83; 95% CI 2.34 to 14.51), unmet mental health needs (aOR 3.08; 95% CI 1.15 to 8.23) and past eviction (aOR 3.99; 95% CI 1.23 to 12.92) were associated with anxiety/depression.

Conclusions

Violence, anxiety/depression are linked to poverty, unstable housing and police enforcement. We need to modify laws to allow sex workers to work safely and increase availability of housing and mental health services.

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The impact of policing and homelessness on violence experienced by women who sell sex in London: a modelling study

Publication

Walker JG, Elmes J, Grenfell P, Eastham J, Hill K, Stuart R, *et al*. The impact of policing and homelessness on violence experienced by women who sell sex in London: a modelling study. *Sci Rep* 2024;**14**:8191. https://doi.org/10.1038/s41598-023-44663-w

Abstract

Street-based sex workers experience considerable homelessness, drug use and police enforcement, making them vulnerable to violence from clients and other perpetrators. We used a deterministic compartmental model of street-based sex workers in London to estimate whether displacement by police and unstable housing/homelessness increases client violence. The model was parameterized and calibrated using data from a cohort study of sex workers, to the baseline percentage homeless (64%), experiencing recent client violence (72%), or recent displacement (78%), and the odds ratios of experiencing violence if homeless (1.97, 95% confidence interval 0.88–4.43) or displaced (4.79, 1.99–12.11), or of experiencing displacement if homeless (3.60, 1.59–8.17). Ending homelessness and police displacement reduces violence by 67% (95% credible interval 53–81%). The effects are non-linear; halving the rate of policing or becoming homeless reduces violence by 5.7% (3.5–10.3%) or 6.7% (3.7–10.2%), respectively. Modelled interventions have small impact with violence reducing by: 5.1% (2.1–11.4%) if the rate of becoming housed increases from 1.4 to 3.2 per person-year (Housing First initiative); 3.9% (2.4–6.9%) if the rate of policing reduces by 39% (level if recent increases had not occurred); and 10.2% (5.9–19.6%) in combination. Violence reduces by 26.5% (22.6–28.2%) if half of housed sex workers transition to indoor sex work. If homelessness decreased and policing increased as occurred during the COVID-19 pandemic in 2020, the impact on violence is negligible, decreasing by 0.7% (8.7% decrease-4.1% increase). Increasing housing and reducing policing among street-based sex workers could substantially reduce violence, but large changes are needed.

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The Effect of Systemic Racism and Homophobia on Police Enforcement and Sexual and Emotional Violence among Sex Workers in East London: Findings from a Cohort Study

Publication

Platt L, Bowen R, Grenfell P, Stuart R, Sarker MD, Hill K, *et al*. The Effect of Systemic Racism and Homophobia on Police Enforcement and Sexual and Emotional Violence among Sex Workers in East London: Findings from a Cohort Study. *J Urban Health* 2022;**99**:1127–40. https://doi.org/10.1007/s11524-022-00673-z

Abstract

There is extensive qualitative evidence of violence and enforcement impacting sex workers who are ethnically or racially minoritized, and gender or sexual minority sex workers, but there is little quantitative evidence. Baseline and follow-up data were collected among 288 sex workers of diverse genders (cis/transgender women and men and non-binary people) in London (2018–2019). Interviewer-administered and self-completed questionnaires included reports of rape, emotional violence, and (un)lawful police encounters. We used generalized estimating equation models (Stata vs 16.1) to measure associations between (i) ethnic/racial identity (Black, Asian, mixed or multiple vs White) and recent (6 months) or past police enforcement and (ii) ethnic/racial and sexual identity (lesbian, gay or bisexual (LGB) vs. heterosexual) with recent rape and emotional violence (there was insufficient data to examine the association with transgender/non-binary identities). Ethnically/racially minoritized sex workers (26.4%) reported more police encounters partly due to increased representation in street settings (51.4% vs 30.7% off-street, p = 0.002). After accounting for street setting, ethnically/racially minoritized sex workers had higher odds of recent arrest (adjusted odds ratio 2.8, 95% CI 1.3–5.8), past imprisonment (aOR 2.3, 95% CI 1.1–5.0), police extortion (aOR 3.3, 95% CI 1.4–7.8), and rape (aOR 3.6, 95% CI 1.1–11.5). LGB-identifying sex workers (55.4%) were more vulnerable to rape (aOR 2.4, 95% CI 1.1–5.2) and emotional violence. Sex workers identifying as ethnically/racially minoritized (aOR 2.1, 95% CI 1.0–4.5), LGB (aOR 2.0, 95% CI 1.0–4.0), or who use drugs (aOR 2.0, 95% CI 1.1–3.8) were more likely to have experienced emotional violence than white-identifying, heterosexual or those who did not use drugs. Experience of any recent police enforcement was associated with increased odds of rape (aOR 3.6, 95% CI 1.3–8.4) and emotional violence (aOR 4.9, 95% CI 1.8–13.0). Findings show how police enforcement disproportionately targets ethnically/racially minoritized sex workers and contributes to increased risk of rape and emotional violence, which is elevated among sexual and ethnically/racially minoritized workers.

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