



Statistical Analysis Plan (SAP)

Work package C:

Overview and study design

This document sets out the proposed statistical analysis plan for work package C of the Sex Workers Evaluate Reporting Violence (SWERV!) Project. The overall aim of the SWERV project is to evaluate implementation, impact and cost (including cost-effectiveness) of a community based violence prevention and survivor support service on sex workers' safety, mental health and access to services. The evaluation uses a participatory mixed-method, quasi-experimental design, informed by realist evaluation principles and the 'DEPTH approach', that uses dialogues with communities and practitioners to co-produce action-oriented research (1). There are 5 linked work packages: (A) first dialogue workshops and mapping; (B) process evaluation; (C) impact evaluation; (D) economic evaluation; (E) second dialogue workshops and research into action.

The objective of work package C is to measure the effect of violence prevention tools on sex workers safety (and working strategies) and mental health. For the quantitative impact evaluation, we are using a prospective cohort study with pre- and post-intervention measurements and a non-equivalent comparison group.

Study population

We recruited sex workers working predominantly in indoor settings (this could include some street or online work), who have sold in-person sexual services in the last 6 months.

Inclusion and exclusion criteria

Inclusion	Exclusion
• Aged 18 years or over • Have sold sex in person indoors, in a city or large urban area within the last 6 months • Live in the United Kingdom • Not a member of National Ugly Mugs (NUM) (for comparison arm) • Became a NUM member after April 2025 (for intervention arm)	• Exclusively street- based sex work, or exclusively online (not providing in person services) • Recent NUM member (for comparison arm) • In secure services (e.g. prison or mental health facility) • No recent experience of selling sex

Recruitment

Baseline recruitment was conducted between June 2025 and March 2026. Follow-up of participants is on-going. Participants are followed up six months following baseline questionnaire beginning January 2026 and ending September 2026.

At baseline, we recruited a total of 453 participants (133 NUM users and 320 Non-NUM users in the comparison group). Recruitment totals fell short of our target of 175 newly-enrolled NUM members and slightly under our target of 325 participants in our comparison group.

Recruitment of non-NUM participants was initially set up to use respondent driven sampling. Midway through recruitment we adapted our strategy to: i) remove the chain referral approach through respondent driven sampling; but ii) still allowing participants to refer others and receive an additional £10 without the requirement to document recruitment links; iii) advertise via two adult service websites and a community online forum through an infographic; and iv) increase the reimbursement for survey completion to £30 from £20.

Recruitment of NUM participants occurred within a two week period of enrolment into NUM membership. Recruitment of new NUM members was slow, and in order to boost numbers we went back to NUM members who had signed up from April 2025 but had not completed the questionnaire, to invite them to participate. Among our NUM sample, 89 (66.4%) participants were newly-enrolled into NUM (within the last two weeks) and 45 (33.6%) were enrolled more than two weeks before participation.

Hypotheses to be tested

We will test the following hypotheses:

1. There will be a 20% reduction in reports of violence between participants engaging with NUMchecker/alerts/reporting and those not engaging with NUM.
2. Increased exposure to NUMchecker/alerts/reporting will be associated with greater reduction in violence.
3. There will be a 20% reduction in the median score of symptoms of anxiety and depression between participants engaging with NUMchecker/alerts/reporting and those not engaging.
4. There will be a 10% increase in reports of violence (all types) to the police or other services between NUM members and non-NUM members.
5. Violence prevention tools increase awareness of dangerous clients to reduce violence among sex workers
6. Intervention effects on violence will be moderated by participants sexual identity, age, location of sex work, precarity (e.g. experience of debt), or racial/ethnic identity.

Hypotheses 1-4 focus on overall effect sizes across our population.

While we are unable to conduct mediation analysis without an intermediate follow-up measure, we will conduct exploratory analysis on potential mediating effects by adjusting for intermediate outcomes (e.g. increased awareness of clients, change in working strategies; avoidance of clients; working with others) on violence outcomes (Hypothesis 5) based on our context-

mechanisms-outcomes-configurations (CMOCs) developed through our linked qualitative study.

As experience of violence and likely access to the interventions differ within sex-working populations, we will examine differential effects of the intervention among sub-groups (e.g. younger age group, those working independently, sexual minorities, migrants, experiencing financial difficulties) (Hypothesis 6).

Sample size justification

Despite the challenges with recruitment particularly in relation to NUM participants, the sample size is still sufficient to compare differences in violence between NUM and non-NUM participants.

For the primary outcome, we assumed a 20 percentage-point difference in the prevalence of violence between intervention (NUM) and comparison groups (non-NUM) at follow-up (Hypothesis 1). This was based on evidence from indoor sex workers participating in the East London Project (2), which showed that screening and refusing clients was associated with reduced client violence. Assuming a baseline prevalence of 45% sexual or physical violence from clients, 90% power, a two-sided alpha of 0.05 (i.e. we are 95% confident that any differences we identify are true differences), and a 1:2 allocation ratio (i.e. we need two times as many non-NUM members as NUM members), this requires a total sample size of 261 participants (87 NUM and 174 comparison).

For the secondary outcome of mental health, we assumed an 18 percentage-point difference between groups at follow-up. Under the same assumptions and given the observed baseline prevalence of anxiety (GAD 7) of 29%, this requires a total sample size of 225 participants (75 NUM, 150 non-NUM). (Hypothesis 3)

We have assumed a 60% retention rate between baseline and follow-up, so we inflated the baseline sample size accordingly. Under these assumptions, the study remains adequately powered to detect differences in both primary and secondary outcome of mental health. We are no longer sufficiently powered to test a 10% increase in access to services.

Exploratory analysis

We assumed, based on characteristics of NUM members and our previous research in 2018 (2), 50% of the sample will identify as lesbian, gay or bisexual; 40% of the sample work at home vs 60% in other venues; 40% are not UK nationals, 49% of the sample are aged between 18 to 30 years, and 50% are in arrears. In the baseline sample, 55.9% of participants identify as LGB, 31.6% work at home¹ compared to 68.4% in other venues²; 13% are non UK nationals; 40.8% are aged 18 to 30 years and 41.2% are in arrears. Our sample size will enable us to examine the extent to which the intervention effects are moderated by these factors (Hypothesis 6)

If we are sufficiently powered, we will also look at how other aspects of context (e.g. by city, for those working from street-based setting or managed venues or independently) or characteristics/experiences of populations (e.g. racial/ethnic and gender minorities, drug use) modify intervention effects, but the study is not explicitly powered to do this.

¹ Defined as either i) your own home or flat where you live without other workers; or ii) your home or flat where you live shared with other workers)

² Defined as any other venue, e.g. someone else's flat or home; working flat, a hotel, bar, dungeon

Data collection

Baseline data

Baseline data was collected using self-completed questionnaires (translated into Polish, Romanian and Portuguese) administered via Open Data Kit (ODK) software, completed via mobile phone or other media devices (laptop, tablets). Questionnaire items were drawn from validated measures and other previously trialled surveys (2, 3). Questions include sociodemographic characteristics, organisation of sex work (e.g. working venue, advertising, safety measures), experience of harm from a client, alcohol and other drug use, history of incarceration, use of services and emotional health and wellbeing. We measure experience of harm from a client through 15 binary questions which capture experience of physical, sexual and emotional violence. Symptoms of anxiety are measured through the Generalised Anxiety Disorder 7 item questionnaire (GAD-7) and symptoms of PTSD are measured through three questions from criterion E of the PTSD Check list (PCL-5). Criterion E questions focus on symptoms of hyperarousal that individuals may experience following a traumatic event. Data are downloaded directly into the LSHTM secured server and personal identifiers are removed from the analytical dataset.

Follow up data collection

All questions remain the same between baseline and follow-up surveys. In addition we added two questions: 1) to record information on social network size of participants; 2) on recent engagement with NUM to assess if participants previously in comparison group became members of NUM over the 6 month follow up period.

Primary outcome

The primary outcome is experience of sexual or physical violence in the last 6 month post-recruitment, commencing from baseline interview date. This is a composite variable consisting of the following measures; experience of physical assault, client refusal to leave (being taken hostage), attempted sex through force, condom removal without consent and pressure to perform services without a condom (self-reported yes/no). A detailed description of all questions used for primary and secondary outcomes is provided in Appendix 1.

Secondary outcomes

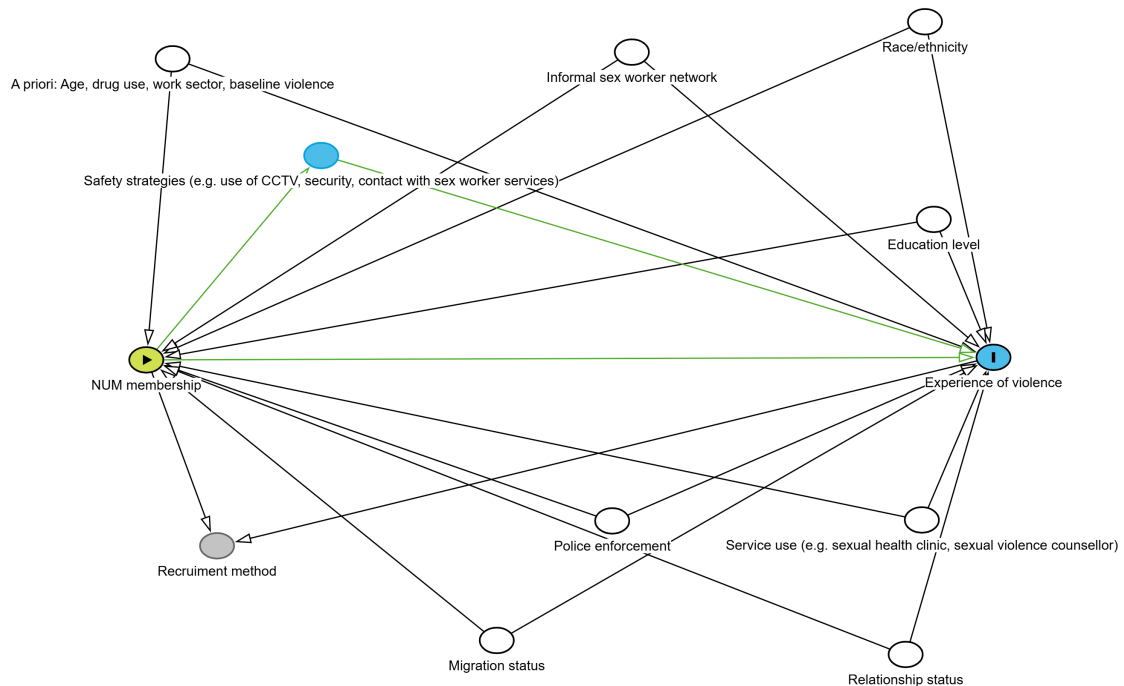
- (1) Emotional violence in the last 6 months, a composite variable of the following measures; repeated unwanted contact (stalking), use of abusive language, belittled or humiliated by a client, threats to be 'outed' (yes/no).
- (2) Expanded Sexual and physical violence in the last 6 months defined as measures listed in primary outcome and in addition: i) sharing of intimate images without consent, ii) forced to drink or spiked your drink; ii) and refusal to pay after services given (yes/no)
- (3) Client refusal to pay after services given in the last 6 months (yes/no)
- (4) Client stealing or attempting to steal personal possessions, money or drugs in the last 6 months (yes/no)
- (5) Anxiety symptoms in the last two weeks assessed through the GAD-7 measure, which captures any experience of nervousness, fear, worry, restlessness, irritability and difficulty relaxing (mean score and yes/no with scores <10 defined as no clinical anxiety and ≥10 probable anxiety).

- (6) Mean score of post-traumatic stress symptoms in the past two weeks assessed through three questions from the PCL-5 (experience of alertness, difficulty sleeping and jumpiness) measured on a Likert scale (0-5)
- (7) Reporting violence incidents to police in the last 6 months (yes/no)
- (8) Uptake of other services (sexual health clinics, mental health services, drug treatment services and outreach services and sexual violence counsellor) in the past 6 months (yes/no)
- (9) Self-efficacy, assessed through 6 questions relating to emotional regulation, conflict management, and behavioural control (mean score)
- (10) Quality of life, assessed through 10 questions regarding wellbeing, coping, relationships, purpose and emotional experiences, in the past week (mean score)
- (11) Wellbeing and capability assessed through 5 questions regarding stability, attachment and overall capability to have a good life (mean score)

Confounders and mediators

We will adjust for pre-specified confounders including age, duration of sex work, work sector, drug use and baseline level of modelled outcome. Further confounders were identified using a directed acyclic graph (DAG) and included structural factors (e.g. police enforcement, and migration status), community and work environment factors (e.g. sex work sector such as home, hotel or managed venues; duration and frequency of sex work; safety strategies such as CCTV cameras, security, working with others, contact with sex worker organisations/services) and individual characteristics (e.g. drug use, gender, racial/ethnic, sexual and gender identity).

Figure 1: Directed acyclic graph showing the hypothesised causal relationship between NUM membership (intervention) and experience of violence (outcome), including confounders (black links) mediator (plain blue circle) and collider (grey circle) variables.



Steps to statistical analyses

Step 1: we will describe the demographic characteristics, working conditions and other potential confounders for participants stratified by exposure group at baseline and follow-up. Continuous variables will be summarised using medians and interquartile ranges and categorical variables using frequencies and percentages (Table 1).

Participants in our comparison sample (non-NUM members) who report using NUMchecker, receiving alerts or reporting incidents through the platform during the follow-up period or who join NUM will be excluded from the primary analysis.

We will review and report the extent of missing data for all variables. If the proportion of missing data is approximately 5%, we will undertake a complete case analysis, with the primary analysis restricted to participants with complete data for the variables included in each model. We do not anticipate missing data to be much higher than 5% based on the analysis of baseline data. Where missing data is >5% we will consider dropping the variable from the analysis. We will not report any numbers less than 10 and will consider collapsing groups to avoid deductive disclosure of small numbers.

Step 2: we will identify potential confounders by assessing baseline imbalances between intervention and comparison groups and using standardized effect sizes (for continuous variables) and standardised differences for categorical variables. Variables demonstrating meaningful imbalance will be considered for inclusion in the propensity score model (>0.1).

Propensity scores will be estimated using logistic regression including a priori confounders and variables demonstrating baseline imbalance. Inverse probability of treatment weights (IPTW) derived from the propensity scores will be applied to estimate treatment effects.

Step 3: We will estimate the relative risk of the following binary outcomes at follow-up: 1) physical or sexual violence in the last 6 month; 2) emotional violence; 3) expanded physical or

sexual violence (2); 4) Client refusal to pay, 5) theft of personal belongings; 6) reporting of incidents to the police and 7) use of other services.

We will first present univariable associations for all outcomes, followed by IPTW-weighted modified Poisson regression models with robust standard errors for binary outcomes, additionally adjusting for the baseline value of the outcome

Differences in mean anxiety symptoms, PTSD, self-efficacy and quality of life scores will be estimated using linear regression. All effect estimates will be presented with 95% confidence intervals.

Primary analysis will use an adjusted individual-level intention-to-treat approach including all baseline participants regardless of their engagement with the NUMChecker/alerts/reporting. (Table3)

Assessing clustering

Among our comparison group, participants were recruited in diverse ways: 10 (5%) were recruited at events or other routes, 179 (55%) via peer referrals; 26 (8%) via RDS and 104 (45%) direct through a website. Among peer referrals 66 (36.8%) participants were recruited by 1 person, and a further 34 participants were recruited by 4 people (each participant recruited between 7 to 11 individuals).

We will take the following steps to assess for clustering via recruitment pathway:

1. Compare and describe social network size among peer recruiters reported at endline against number of participants recruited by that peer, at baseline
2. Compare primary outcome by recruitment route (individual peers; website; RDS/other)
3. Compare demographic characteristics by recruitment route
4. Account for both within-participant clustering and clustering in recruitment approach through GEE model or cluster-robust Standard Errors (Table 3)
5. Conduct sensitivity analysis and remove participants from dominant recruiters (e.g. main person who recruited their peers) and compare estimates with the primary complete case analysis

Exploratory Mediation Analysis

While we are unable to conduct mediation analysis without an intermediate follow-up measure, we will conduct exploratory analysis on potential mediating effects by adjusting for intermediate outcomes (e.g. increased awareness of clients, change in working strategies; avoidance of clients; working with others, peer support; changes in perceived self-efficacy) on violence outcomes (Hypothesis 5) based on our CMOCs. (Table 4)

Per protocol analysis

A per protocol analysis will also be conducted to estimate the effect of NUMchecker/alerts/reporting among those who report use of the NUM checker in the intervention arm (Hypothesis 2). (Table 5)

Sensitivity analyses

We will conduct sensitivity analyses to account for participants previously in comparison groups becoming members of NUM in the follow up period. We will reassign these participants to the intervention arm (NUM group).

Use of NUM's prevention tools

We will also describe use of NUM's prevention tools, including frequency of reporting, use of the NUM Checker and number of NUM alerts read for our intervention group alongside programmatic data routinely collected through NUM. (Table 2) The data management plan is provided in Appendix 2.

Table 1: Characteristics of sex workers working in indoor locations by survey round and membership of NUM

	Baseline		Endline	
Characteristic				
	Intervention	Comparison	Intervention	Comparison
	N (%)		N (%)	
Total				
Age (years, median (IQR))				
Gender				
Male				
Female				
Non-binary /genderqueer/ agender/ gender fluid				
Transwoman				
Trans man				
Intersex				
Ethnicity				
Racialised minority				
White				
Sexuality				
Heterosexual				
Gay / lesbian				
Bisexual				
Queer				
Pansexual				
Unknown or unstated				
Migration status				
UK National				
National of other country				
Refugee or asylum seeker				
Permanent resident				
Level of education				
Higher education				
Further education				
Secondary education				
Primary education				
Less than primary				
Unknown or unstated				
Relationship status				
Single				

Dating				
Long term relationship (e.g. married)				
Other				
Workplace				
Home (alone)				
Home (shared)				
Working flat				
Someone else's flat				
Sauna or massage parlour				
Bar or club				
Hotel or B&B				
Organised party				
Clients home				
Student halls				
Unknown or unstated				
Working region in the UK				
North East				
Scotland				
London				
South West				
South East				
North West				
East of England				
Wales				
Age of first sex work (median (IQR))				
Average weekly earnings (£) (median (IQR))				
Member of sex worker organisation				
Formal organisation				
Informal organisation				
No membership				
Access of services in last 6 months				
Primary care (e.g. GP)				
Sexual violence counsellor				
Mental health clinic				
Drug treatment service				
Food bank				
Support service or outreach programme				
Job Centre				
Sexual health clinic				
Police or law enforcement contact in last 6 months				
Yes				
No				
Prison in last 6 months				
Yes				
No				
Alcohol use in last 6 months (Audit-C score)				
Drug use in the past 6 months				
None				

Daily (or almost daily)				
Weekly				
Monthly				
Less than monthly				
Physical and sexual violence in last 6 months				
Yes				
No				
Emotional violence in the last 6 months				
Yes				
No				
Sexual and physical violence (2)				
Yes				
No				
Client refusal to pay in the last 6 months				
Yes				
No				
Theft of possessions in the last 6 months (by client)				
Yes				
No				
Self-efficacy score				
High self-efficacy (>18)				
Low self-efficacy (<18)				
GAD-7 score				
Negative (no clinical anxiety symptoms) (<10)				
Positive (probable anxiety symptoms) (≥10)				
Mean (range) PTSD (PCL-5) score				
Reporting violence incidents to police in the last 6 months				
Yes				
No				
Uptake of other services in the last 6 months				
Yes				
No				
Overall ReQoL score				
0-25 (poor QoL)				
26-40 (good QoL)				
Mean ICECAP-A score (SD)				

Table 2: Characteristics and use of NUM prevention tools among survey participants and NUM members during study period.

	Intervention		Total n(%)	Programmatic data		Total n(%)
	Baseline	Endline		Baseline	Endline	
	n(%)	n(%)		n(%)	n(%)	
Total enrolled						
Age, years (median and IQR)						
Gender						
Ethnicity						
Racial minority						
White						
Use of NUM Checker in last 6 months (yes/no)						
Frequency of using NUM checker in past month						
Always						
Sometimes						
Never						
Not used						
Unstated						
Signed up for NUM alerts (yes/no)						
Common alert filters used						
Work type						
Working location						
Age						
Gender						
Region						
Unstated						
No. of alerts read over past month (median and IQR)						
Reported to NUM (the past 6m) (yes/no)						
Reporting reason						
Harm or violence						
Time wasters or nuisance callers						
Harm from a professional						
Other						
Frequency of reporting a violent incident (over the past month)						
Always						

Sometimes						
Never						
I haven't reported to NUM in the past month						
No violence incident						
Unknown						
Frequency of reporting a time waster (over the past month)						
Always						
Sometimes						
Never						
I haven't reported to NUM in the past month						
No timewasting incident						
Services accessed through NUM in last 6 months						
None						
Case workers						
Counselling services						
Legal support						
Drop-in						
Mental health/therapy packages						
Vouchers						
Vocational support						
Other						
Unstated						

Table 3: Effect of NUM's prevention tools on primary and secondary outcomes among sex workers across the UK (2026-2026)

			Unadjusted		Adjusted			
	Comparison	NUM			IPTW		Cluster	
	n/N	n/N	RR (95% CI)	P value	aRR (95% CI)	P value	aRR (95% CI)	P value
Experience of violence in the last 6 months**								
Experience of emotional violence in the last 6 months								
Reporting of violence to services								
Probable anxiety (yes/no)								
Mean difference for NUM users versus comparison								
Symptoms of anxiety in the past 2 months								
Experience of PTSD symptoms in last two weeks								
Perceived self-efficacy in last 6 months								

Table 4: Exploratory analyses: effect of NUM's prevention tools on sexual and physical violence within sub-groups of sex workers

Subgroup	Comparison (n/N)	Intervention (n/N)	Unadjusted RR (95% CI)	Adjusted RR (95% CI)
Age				
	Age <30 years			
	Age >30 years			
Gender				
	Female (cis/trans)			
	Male (cis/trans)			
Sexuality				
	LGBTQ			
	Heterosexual			
Race/ethnicity				
	Racialised minority			
	White			
Region of work				
	Work in London			
	Work outside of London			
Type of sex work				
	Work at home			
	Work in other settings			
Precarity				
	Up to date with bills			
	Behind with bills			

Table 5: Per protocol analysis

		Adjusted			
		IPTW		Cluster	
	P value	aRR (95% CI)	P value	aRR (95% CI)	P value
Experience of violence in the last 6 months**					
Experience of emotional violence in the last 6 months					
Reporting of violence to services					
Probable anxiety (yes/no)					
Symptoms of anxiety in the past 2 months					
Experience of PTSD symptoms in last two weeks					
Perceived self-efficacy in last 6 months					

References

1. Marston C, McGowan C, Stuart R, Kuhlbrandt C, Miles Sam, Grenfell P, et al. Routes: new ways to talk about COVID-19 for better health (final report) A focus on Gypsy, Roma and Traveller communities, and migrant workers in precarious jobs. DEPTH Project, London; 2022.
2. 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.* 2021;sextrans-2021-055088.
3. Platt L, Grenfell P, Bonell C, Sarah Creighton, Kaye Wellings, John Parry, et al. Risk of sexually transmitted infections and violence among indoor-working female sex workers in London: the effect of migration from Eastern Europe. *Sexually Transmitted Infections.* 2011;87:377-84.

Appendix 1

Table 1: Primary and Secondary Outcomes

Hypothesis to be tested	Measure	Variable
There will be a 20% reduction in reports of violence between participants engaging with NUMchecker/alerts/reporting and those not engaging (H1)	1. Proportion of sex workers who report physical violence from a client in the last 6 months (yes/no)	Harm_2 - In the last 6 months, has a client physically assaulted you? E.g. pushed you, shoved you, slapped you, strangled you or thrown something at you that could hurt you?
		Harm_15 - In the last 6 months, has a client refused to leave, refused to let you leave or taken you against your will, even for a short time (taken hostage or kidnapped)?
	2. Proportion of sex workers reporting sexual violence in the last 6 months (yes/no)	Harm_4 - In the last 6 months, has a client attempted to get sex through force or threat (e.g. oral, vaginal or anal sex or pushed boundaries, sexual acts or fetishes not offered)?
		Harm_12 - In the last 6 months, has a client removed or attempted to remove a condom without consent?
		Harm_11- In the last 6 months, has a client pressured you to perform services without a condom against your wishes?
	3. Proportion of sex workers reporting emotional violence in the last 6 months (yes/no)	Harm_3 - In the last 6 months, has a client made or attempted repeated unwanted contact online, by phone or in person including following you (stalked)? Harm_5 - In the last 6 months, has a client used abusive or insulting language towards you such as calling you inappropriate names ? Harm_6- In the last 6 months, has a client belittled or humiliated you in front of other people? Harm_8 -In the last 6 months, has a client threatened to hurt you or someone you care about? Harm_9- In the last 6 months, has a client ever threatened to tell others (e.g. partner, employer, landlord, neighbours, police, immigration, friends, family, publish online) that you do sex work ("out" you)? Harm_13-In the last 6 months, has a client done things to scare or intimidate you on purpose?

	4. Proportion of sex workers reporting sexual or physical violence (expanded) in the last 6 months (yes/no)	Harm_2 - In the last 6 months, has a client physically assaulted you? E.g. pushed you, shoved you, slapped you, strangled you or thrown something at you that could hurt you? Harm_15 - In the last 6 months, has a client refused to leave, refused to let you leave or taken you against your will, even for a short time (taken hostage or kidnapped)? Harm_4 - In the last 6 months, has a client attempted to get sex through force or threat (e.g. oral, vaginal or anal sex or pushed boundaries, sexual acts or fetishes not offered)? Harm_12 - In the last 6 months, has a client removed or attempted to remove a condom without consent? Harm_11- In the last 6 months, has a client pressured you to perform services without a condom against your wishes? Harm_7 - In the last 6 months, have you had money (or possessions) taken or refusal to pay after a service given ? Harm_14 - In the last 6 months, has a client has a client spiked your drink or forced, pushed or pressured you to take drugs or drink alcohol against your will? Harm_16- In the last 6 months, has a client created, taken or shared intimate images of you without your consent?
	4. Proportion of sex workers reporting refusal to pay after service given in last 6 months (yes/no)	Harm_7 - In the last 6 months, have you had money (or possessions) taken or refusal to pay after a service given ?

There will be a 20% reduction in the median score of symptoms of anxiety and depression between participants engaging with NUMchecker/alerts/reporting and those not engaging. (H3)	1. Mean difference in Generalised anxiety disorder -7 (GAD-7) score between comparison and intervention	59. Feeling nervous, anxious or on edge? 60. Not being able to stop or control worrying? 61. Worrying too much about different things? 62. Trouble relaxing? 63. Being so restless it's hard to sit still? 64. Becoming easily annoyed or irritated? 65. Feeling afraid as if something awful might happen?
	2. Mean difference in PTSD score (sample questions from PCL-5) between comparison and intervention	66. Being "super-alert" or watchful or on guard? 67. Feeling jumpy or easily startled? 68. Trouble falling or staying asleep?
	3. Mean difference in ReQoL-10 score between comparison and intervention	77. I found it difficult to get started with everyday tasks 78. I felt able to trust others 79. I felt unable to cope 80. I could do the things I wanted to do 81. I felt happy 82. I thought my life was not worth living 83. I enjoyed what I did 84. I felt hopeful about my future 85. I felt lonely 86. I felt confident in myself

There will be a 10% increase in reports of violence to the police or other services between NUM members and non-NUM members. (H4)	1. Proportion of sex workers reporting violence to police and other services between comparison group and intervention	70. Which of the following people or organisations did you share the information with? ? Adult service website platforms National Ugly Mugs (yes/no) Ugly Mugs (ie) (yes/no) Healthcare professionals (yes/no) Police (yes/no) Sex worker organisations (yes/no) Key workers (e.g. at a hostel, drug treatment centre, or a mental health service) (yes/no) Domestic violence organisation (yes/no) Sexual violence organisation (yes/no)
Violence prevention tools increase awareness of dangerous clients to reduce violence among sex workers (H5)	1. Proportion of sex workers reporting confidence in self-efficacy between comparison and intervention. Binary outcome (confident/not confident).	35. How confident do you feel assessing safety risks from a client? (e.g. through their behaviour, mannerisms, tone of voice, whether they follow instructions etc.)? 36. When you receive information about a client safety risk, how confident do you feel about acting on this information? E.g. stopping a booking or asking for help, setting up extra safety measures, emphasising boundaries. 38. How confident do you feel to de-escalate a situation where a client becomes agitated or unpleasant? 39. How confident do you feel to re-direct clients' behaviour if unwanted or veering towards boundary crossing? 40. How confident do you feel negotiating boundaries before a booking, whether by email, phone, or discussion in person?

Appendix 2: Data management

The following steps will be taken to manage the baseline and endline datasets.

1. A sequential study ID will be added to each new submission (through ODK) through an R script, which will use the time and date of submission as method of order.
2. All key identifiable data such as contact information will be removed from the main dataset and transferred to a new dataset called 'follow_up', which will contain contact information, payment information, names used in the study and ID. This will be password protected and stored on LSHTM's secure server.
3. The variable 'num_user' will be used to identify whether participants are comparison or intervention group at baseline.
4. A further dataset will be created containing referral information called 'referral_data.csv', containing only the study ID and the contact information or name of the person they were referred by.
5. Baseline data will be referred to as 'swerv_data_anonymised.csv', all data will be stored in csv format.
6. At follow up participants will be provided with their study ID from baseline (linked via the contact information csv file). The follow-up questionnaire will contain a new variable 'study_ID' which will be completed by the participants. Follow-up data will be merged

with baseline data using the 'study_ID' variable in R, in wide format and renamed 'full_swerv_dataset.csv'.

7. A new variable will be created 'baseline_fup', which will indicate baseline or follow up data – binary variable
8. Intervention variable will be created from 'start.num_user' and will remain a binary variable, 'yes' referring to intervention use, 'no' for comparison group.
9. A variable will be created to identify participants that cite intervention use at follow-up when previously recorded as comparison.