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Disclosure of violence against women and girls in Senegal

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Abstract

Measures of violence against women and girls (VAWG) are widely collected in surveys, yet estimates are acknowledged to be lower-bounds of the true prevalence. Disclosure may be affected by numerous factors, including shame and stigma, fear of retaliation, distrust of interviewers or desire to keep the perpetrator's identity confidential. We conduct a survey experiment randomly assigning approximately 3,400 women and girls aged 15 to 35 to either face-to-face interviews or audio computer-assisted self-interviews (ACASI). Results show participants in the ACASI group report higher prevalence of lifetime intimate partner violence by 4 to 7 percentage points compared to face-to-face interviews. Differences in reporting for non-partner VAWG are even larger, ranging from 6 to 12 percentage points for physical violence and sexual harassment, respectively. We test for correlates of characteristics which might lead to increased disclosure, however, we find few notable patterns. Our results suggest that ACASI surveys are a promising way to encourage disclosure, but acknowledge trade-offs that include limits in the complexity of questions that can be asked and higher time costs associated with development and implementation of surveys.

Keywords: Violence against women and girls, intimate partner violence, measurement, Senegal

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Introduction

Violence against women and girls (VAWG) measures are widely collected in surveys and important metrics for health, human rights and gender equality, as reflected in Sustainable Development Goal (SDG) targets. VAWG includes, but is not limited to physical, sexual and psychological violence perpetrated by intimate partners, family, co-workers, acquaintances or strangers, both in and outside the home. Despite advancement in data collection methodology, estimates from household surveys are universally acknowledged to be lower-bound estimates of the true prevalence (Sardinha et al., 2022). While the magnitude of under-reporting is thought to vary by data source, target group and type of violence—evidence suggests under-reporting can be substantial. For example, a cross-country paper examining nationally-representative samples in 24 low- and middle-income countries (LMICs) found that only 40 percent of females aged 15 to 49 experiencing physical and/or sexual VAWG previously disclosed it to anyone, and only 7 percent reported it to a formal source (e.g., health, legal or social service) (Palermo et al., 2014). Administrative data from formal sources is thus widely recognized to represent only the most severe cases, influenced by access to and trust in services, perceptions around impunity and financial ability to seek formal assistance, among others. While household surveys are understood to be closer to the true prevalence, disclosure in household data collection may be affected by a myriad of factors, including shame and stigma, fear of retaliation, cognitive dissonance, distrust of interviewers or desire to keep the perpetrator's identity confidential (Akerloff & Dickens,1982; Palermo et al., 2014; Pereira et al., 2020). Rates of disclosure have implications for data quality and understanding impacts of programs and policies to prevent and respond to VAWG, as well as for directing resources towards the issue as an investment in public health and human rights.

Researchers have sought to understand how to accurately capture VAWG measures through different strategies. These include design of survey instruments to capture multiple behaviorally specific and diverse violent acts, specialized training of enumerators, and modification of data collection protocols

to build rapport and create a safe space for disclosure. A set of studies also focus on rigorously testing different survey administration techniques to increase disclosure and protect participant confidentiality. These studies typically compare enumerator-administered face-to-face surveys to audio computer-assisted self-interviewing (ACASI) techniques; however, others include phone interviewing, sealed envelope methods and qualitative methods (see Annex Table A1 for list of studies).[1] The basic assumption across studies is that soliciting responses with methods that provide increased privacy and confidentiality will reduce response bias by reducing shame, stigma, social desirability and fear of adverse consequences linked to disclosure. As hypothesized, all eight studies reviewed except one finds differences in prevalence of VAWG across modality of reporting, although most studies also show heterogeneity in these differences across different settings or violence outcomes (Assefa et al., 2022; Barr et al., 2017; Cullen, 2022; Park et al., 2022; Punjabi et al., 2021; Rathod et al., 2011; Stark et al., 2018; van der Elst et al., 2009). The closest to the current study are Cullen (2022) and Park and colleagues (2022), who randomize ACASI and face-to-face surveys to collect measures of intimate partner violence (IPV) in Liberia, Malawi and Rwanda. In Rwanda, Cullen (2022) finds that women report higher sexual IPV (3 percentage points, pp) using ACASI, but no differences in physical IPV. Likewise, men report higher rates for some but not all emotional IPV questions using ACASI compared to face-to-face. Park and colleagues (2022) find that women report higher values for all forms of IPV in Malawi when using ACASI (ranging from 5 – 18 pp); however, in Liberia, higher rates are seen only for sexual IPV using ACASI. Based on responses to non-sensitive questions, Park and colleagues (2022) suggest that increased prevalence in ACASI surveys may be in part due to 'spurious reporting' driven by inability of participants to correctly key in responses on tablets. Thus, questions remain as to how well rural populations with low digital literacy, in particular, are suited to answer ACASI questions without prior training or close quality assurance.

[1] A related group of studies examines differences in reporting with across face-to-face surveys using indirect (versus direct) methods for soliciting responses. For example, studies may use the 'list randomization' technique, vignettes or ask about experiences of neighbors or other community members (Cullen, 2022; Lépine et al., 2020; Peterman, 2021; Peterman et al., 2018).

This paper adds to the variable and limited literature on the role of survey administration on disclosure of VAWG. We conduct a survey experiment randomly assigning approximately 3,400 adolescent girls and young women aged 15 to 35 in rural Senegal to either face-to-face interviews or ACASI. Results show participants in the ACASI group report higher prevalence of lifetime IPV by 4 to 7 pp compared to face-to-face interviews and these differences are more pronounced for more sensitive types of violence. Differences in reporting for non-partner VAWG are even larger, ranging from 6 to 12 pp, for physical violence and sexual harassment, respectively. For our preferred measures of any physical and/or sexual violence, these differences equate to a 39 percent increase in prevalence for IPV and a 23 percent increase in prevalence for non-partner VAWG among participants using ACASI (as compared to face-to-face administration). Results for continuous measures of violent acts and for past-year measures mirror those for lifetime experience. We test for correlates of characteristics which might lead to increased disclosure, however, we find few notable patterns to explain these findings. Our results suggest that self-administered surveys are a promising way to encourage disclosure, but acknowledge trade-offs that include limited complexity of questions that can be asked and higher time costs associated with development and implementation of surveys.

We contribute to the literature in a number of ways. First, we show how rates of disclosure compare in a rural and conservative setting across a population of both adolescent girls and young women. Second, we collect scales of multiple types of IPV and non-partner VAWG perpetrated by individuals inside and outside the home. Thus, we are able to differentiate how disclosure rates vary by experiences with different levels of severity, associated stigma and proximity to the perpetrator. Previous studies on the role of survey administration have focused on IPV or on other specific forms of violence against children (e.g., school violence), often with limited outcome indicators, rather than holistic scales. Third, we conduct analysis to show if disclosure varies by characteristics hypothesized to influence women's ability and willingness to report VAWG, including examination of logistical factors encountered in survey work, as well as validated scales capturing violence attitudes and norms. While few

factors stood out as being strong correlates, in theory these factors can help unpack which groups are more or less likely to under-report in typical household surveys or in response to a particular intervention. Finally, we highlight lessons from development and implementation of the ACASI, with implications for future survey efforts aiming to conduct similar data collection efforts. We conclude by discussing key evidence gaps for future research on the role of survey administration to increase the accuracy of VAWG measures, while implementing data collection in a participant-focused and ethical manner.

Context

Acceptability and prevalence of VAWG in Senegal

The setting of this study, Senegal, ranks as having high levels of gender inequality (139 out of 166 countries on the Gender Development Index) (United Nations, 2021). Senegal's 1999 revision of the Penal Code includes a clause criminalizing acts of domestic violence, defined as 'wounding, striking or physical abuse against partners,' punishable with up to five years in prison (and twenty years for domestic homicide) (OECD, 2014). However, the law does not recognize marital rape, or other forms of sexual or emotional IPV, and few women seek formal legal action, possible in part as police and other actors in the justice system are perceived to be lenient on perpetrators. Analysis of nationally-representative data shows that approximately half of women in Senegal have attitudes supporting physical IPV, however this percentage increases to 64 percent in rural areas (Zegeye et al., 2021). Another analysis of a rural demographic surveillance site (Niakhar) shows similar levels of IPV acceptability among men and women at 61 percent—with highest levels for scenarios when a women refuses sex, goes out without telling her husband or neglects children (Sandberg et al., 2021). Despite the high acceptance of IPV, official levels of IPV in Senegal are well below regional averages in West Africa. A global review using data from 366 studies across 161 countries estimates lifetime rates of sexual and/or physical IPV in West Africa at 27 percent (uncertainty levels: 22 – 33%) and past-year estimates at 15 percent (uncertainty levels: 12 – 19%) (Sardinha et al., 2022). However, the most recent Senegalese Demographic and Health

Survey (DHS) collected in 2019 estimates these same figures to be approximately 13 and 6 percent for lifetime and past-year, respectively (ANSD & ICF, 2020). Thus, official IPV prevalence for Senegal can be considered low for the region, raising questions as to whether Senegal is truly an outlier or if official statistics face substantial underreporting.

Qualitative evidence on acceptability and disclosure of VAWG in study sample

The study took place across two regions of Senegal—Kaolack in central Senegal, and Kolda in the south. These regions are both geographically and culturally distinct, with Kaolack composed mainly of Wolof ethnicity, and Kolda composed mainly of Fulakunda ethnicity (belonging to the Pular ethnic group). Qualitative narratives among women and community health volunteers in study communities show that acceptability and disclosure of VAWG varies widely across the study sample.[2] VAWG was viewed as unacceptable in some communities and warranted intervention by both community leadership (or elders) and bystanders, while in others it was normalized, and dominant narratives promoted silence to avoid 'meddling in others' family affairs.'

> *"These days, if you hurt your wife in the home and someone knows about it, people can file a complaint—and they will see how to find a solution so that it will stop"… "The community will never sit back 'fold their arms' on cases of violence happening in this village" ~ Focus group married women, Kaolack*
>
> *"Abuse a woman, the community says nothing" … "The elders of this village, they won't say anything, because not everyone interferes with the lives of others. Of course, your parents might come to you to talk about it, but otherwise, you'll stay in this marriage until the end of your days" ~ Focus group married women, Kolda*

[2] Data comes from 10 focus group discussions among women, eight individual in-depth-interviews and four key informant interviews with community health volunteers (who are often the first point of contact for women experiencing violence), stratified by region. Additional information regarding methodology and protocols related to the qualitative data collection can be found in Le Port et al. (2022).

The majority of women interviewed as part of the qualitative data collection believed some form of IPV was normal in partnerships, as well as violence from in-laws or originating from extended family structures. Most women also mentioned disclosing violence to confidants and soliciting support or advice (including mothers, uncles, aunts, brothers or in-laws). Community health volunteers concurred with the view that violence was a normal part of life and that few options existed for women in rural areas for support or assistance—several mentioning that they explicitly advise women *not* to take action if they experience violence.

> *"What I advise them to do is as I did: be patient, pray for a long life, and know that sooner or later things will get better … here you can't come and tell someone to go to the police, file a complaint, as there's no follow-up … there are no social services, you cannot even talk to a social worker!" ~ Community Health Volunteer, Kaolack*
>
> *"As is the case for all couples, there may be problems—but, as they say: 'dirty laundry is washed at home'—so their intimate problems, they can settle internally. They won't need to tell me." ~ Community Health Volunteer, Kolda*

However, some community health volunteers mentioned they took action to counsel families and spoke with men about violence in order to resolve it and keep it from escalating to more serious (and fatal) outcomes—advocating for additional support for survivors to respond to underlying causes that intensify and trigger violence. Taken together, qualitative data suggests there is wide variation in acceptance of VAWG in study communities (low acceptance may drive under-reporting in some communities due to stigma or shame), as well as views that violence is a family issue (which may leave women reluctant to discuss with an 'outsider').

Study design

Data collection and the measurement experiment

We experimentally test the role of survey administration in the endline survey of an edutainment evaluation designed as a cluster randomized control trial (cRCT) in 117 rural villages across Kaolack and Kolda (Annex Figure A1), The study targeted adolescent and young adult women aged 14 to 34 at baseline, fluent in the dominant local language, and living up to two kilometer radius to the village primary school. At endline, women were approximately 15 to 35 years old. The endline survey took place from December 2020 to January 2021 led by the International Food Policy Research Institute (IFPRI) Dakar and ASSMOR consulting. Of the 3,968 adolescent and young adult women interviewed at baseline, 86 percent (or 3,430) were successfully interviewed at endline. Further information on the broader evaluation can be found elsewhere (Le Port et al., 2022).

The survey experiment was embedded in an enumerator administered survey, lasting on average 55 minutes and consisting of multi-topic modules related to knowledge, attitudes, and behaviors on maternal and child health, sexual and reproductive health and VAWG. The last module of the survey was on VAWG experiences and included a randomized assignment to either face-to-face (1/3 of the sample) or ACASI (2/3 of the sample) administration (Figure 1). We choose these probabilities, as we anticipated higher reported rates of violence from ACASI interviews, thus a larger ACASI proportion would increase our ability to detect effects on VAWG in the primary cRCT. However, if respondents failed to demonstrate they understood how to operate the tablet, or if they voiced preference for not using the tablet, they were reassigned to face-to-face interviews (16 percent of the ACASI group, or n=370). Conversely, for face-to-face interviews, enumerators screened participants based on their ability to be interviewed in private. If enumerators were unable to secure privacy, participants were reassigned to ACASI interviews (2 percent of the face-to-face group, or n=20). The final modality distribution was 44 percent face-to-face and 56 percent ACASI interviews.

The entire survey, including the ACASI portion was coded using SurveyCTO, and the ACASI module was developed and tested based on an iterative process. First, experienced enumerators who had administered VAWG modules previously were selected to collaboratively develop local language scripts (Wolof and Pular). Thereafter, all questions and scripts were recorded into audio clips and validated for sound quality as well as accuracy and fidelity to the original scripts in French. Audio recordings were then preloaded onto the SurveyCTO platform, coded alongside visual images representing answers to questions. A green circle indicated "Yes", a red square indicated "No" and an outline of a star indicated "Refusal or do not know" (Annex Figure A2). ACASI scripts and functionality were further tested during enumerator training and piloting, including iterative cognitive interviews with approximately 40 women selected during the piloting of the entire survey (undertaken once in urban Dakar and once in a rural area outside Dakar). Pilots showed that women were able to respond to the ACASI module, understood the questions and the vast majority preferred ACASI as compared to enumerator administered violence questions. Based on the pilots, small changes to audio recordings and to the tablet screening and functionality were made to increase participant's understanding of the module before data collection.

During actual implementation of the VAWG module, for the ACASI arm, enumerators keyed in the local language of choice, introduced the ACASI, and explained to participants how to listen to questions using headsets, how to repeat them if needed, how to enter responses and advance the module. Participants then undertook three test questions with the enumerator watching. These test questions were structured such that all participants should both know the answer and either pick "Yes" or "No"—for example: *"Is Macky Sall the president of Senegal?"* (answer: Yes). At the end of the practice session, enumerators asked if participants were comfortable undertaking the module. Enumerators sat nearby while women completed ACASI in case there were any questions or need for intervention, for example, to explain to other household members that women and girls should be left alone to complete the survey if interruptions occurred. Table A2 gives details on the screening questions administered, showing that high levels of women passed test questions—in total 89 percent of the sample answering all three correctly.

[Figure 1 here]

Violence against women and girls measures

We collected two primary groups of VAWG measures. The first set of questions were modeled after the Senegalese DHS to capture past-year and lifetime IPV using a modified conflict tactics scale following the WHO multi-country study on domestic violence (ANSD & ICF, 2020; Garcia-Moreno et al., 2006). These questions were asked only to women and girls who were currently partnered or partnered in the previous 12-months, including non-cohabiting and dating partners. Specific questions include those related to emotional IPV (5 questions, e.g., *partner said something to humiliate you in front of others*), physical IPV (7 questions, e.g., *partner tried to choke you or burn you on purpose*), and sexual IPV (3 questions, e.g., *partner physically forced you to have sexual intercourse with him when you did not want to*). The second set of questions combines validated instruments for non-partner domestic violence, sexual harassment and community violence, as no single common instrument is routinely used to cover a diverse set of perpetrators, locations and types of violence. These questions also asked about lifetime and past-year experience related to emotional VAWG (6 questions, e.g. *spread false rumors about you or one of your children*), physical VAWG (4 questions, e.g., *forced you to work excessively against your will*), and sexual harassment and violence (8 questions, e.g., *made unwelcome attempts to establish a romantic or sexual relationship with you, despite your efforts to discourage it*). The second set of questions was asked to all participants, with the caveat that items pertained to all possible perpetrators (both male or female) except current or previous romantic partner. Table A3 gives detailed descriptions of questions and indicators used for violence outcomes, including the coding of missing indicators.[3]

[3] Due to the way we code "don't know / refuse" answers, the total sample sizes for each aggregate are slightly different. For example, for binary outcomes (such as any violence) we code the entire aggregate as missing, if at least one of the items is missing, and none of the other responses are affirmative (as this means the entire aggregate could be 'Yes' or 'No'), but as non-missing if at least one item is coded as affirmative. This strategy ensures that the overall VAWG aggregate is not biased downward because of missing responses. For continuous outcomes, we simply sum each act of violence that is non-missing and create a standardized z-score of the sum in relation to the comparison group (face-to-face administration).

In addition to the main behavioral outcomes, we also present auxiliary violence indicators: 1) if the respondent would hypothetically intervene in the case of a neighbor's physical IPV (full sample), 2) if she has told anyone about IPV in the last 12 months (including friends, family etc.), and 3) if she has tried to get help to stop IPV from happening in the last 12 months (latter two indicators for the partnered sample only). We hypothesize that the same factors potentially driving under-reporting for experience measures would operate for these measures. For example, if IPV is thought to be a "family" issue or accepted within spousal relationships, women are unlikely to view intervening to stop abuse as an acceptable action in the case of a neighbor's situation. In addition, there may be shame or stigma attached to discussing IPV outside the couple, or seeking help, as social norms may dictate that women should tolerate violence or keep discussion or disclosure of violence within the family.

Ethical protocol

Ethics approval for the study was granted by the *Comité National d'Ethique pour la Recherche en Santé* in Senegal (#00000929 MSAS/DPRS/DR) and by the Institutional Review Board of the International Food Policy Research Institute (IFPRI) (#00007490). These included amendments for implementing surveys during COVID-19, and ensuring safety and equipment protocols were in place for enumerators and participants. We implemented standard protocol set out by the WHO to ensure the safety of participants and enumerators while collecting violence data (World Health Organization, 2001). All interviews were carried out by female enumerators, matched by language group (Wolof, the dominant language in Kaolack, or Pular, the dominant language in Kolda), who underwent specialized training on interviewing for VAWG topics, with preference in recruitment given to enumerators who had experience collecting sensitive data. During interviews, written informed consent was obtained from all participants at the start of the survey. For minors, written assent was obtained, along with written informed consent from the legal guardian. The study followed best practice during interviews by ensuring privacy (with the exception of children under the age of two), implementing graduated informed consent, allowing women to skip questions voluntarily and advertising the survey as related to health and wellbeing—rather than

linked explicitly to VAWG. All participants, regardless of disclosure were given a card with de-identified local referral sources (as well as a toll free national hotline), unless they indicated they could not safely keep the card without others, including partners, discovering it. In this case, enumerators orally discussed options and hotline information. Enumerators offered direct referrals, whereby service providers would seek out women and girls directly for acute cases or upon request of participants. Acute cases were monitored to ensure proper and timely response. Both de-identified and direct referrals were offered to women regardless of whether or not they responded to questions face-to-face or via ACASI. Enumerators were offered access to the same services and assistance as survey participants.

Analysis

We conduct two main analyses. First, we conduct simple mean comparisons of VAWG outcomes among women and adolescent girls randomized to ACASI versus face-to-face interviews, and report the coefficient of being assigned to ACASI from unadjusted linear probability regressions with standard errors clustered at the village level. We also conduct a variety of sensitivity analysis, controlling for additional background characteristics of participants and their households, as well as enumerator fixed effects, which may influence the quality of the survey implementation. Background characteristics include: age splines, levels of educational achievement, ethnicity indicators, household size and an indicator if the participant is partnered.[4] As not all participants ultimately completed the survey modality they were assigned, this analysis is akin to an intent-to-treat (ITT) analysis. We present results for lifetime VAWG measures, however replicate results for the 12-month measures as a robustness check. In addition, following evidence showing that conceptually using continuous measures capturing the number or frequency of distinct acts of VAWG is distinct from binary outcomes, and may result in different conclusions, we analyze summary counts of different violent acts constructed as z-scores, for each type of VAWG category (Boyer et al., 2022; Peterman, Valli, et al., 2022). Finally, we estimate results for actual

[4] We impute a small number of missing observations for background characteristics, including age, education, ethnicity and partnership status—from 0 to 29 observations (or <1 percent of the sample).

administration of ACASI versus face-to-face using an instrumental variable approach (akin to treatment-on-the-treated or TOT analysis) using the indicator for randomization to ACASI as the instrument.

Second, we analyze heterogeneous effects to explore possible factors that may explain differences in reporting, by adding indicators of interest to the regression and interacting them with the ACASI indicator. We explore two groups of indicators: 1) logistical factors hypothesized to discourage disclosure and 2) attitudes and norms normalizing VAWG. The first group of indicators includes: a) an indicator indicating if her spouse or partner is cohabiting (as partners migrate for work in this setting), b) an indicator of crowding (number of household members / number of sleeping rooms), and c) an index of the number of times the interview had to be stopped due to an interruption (by a partner or other male adult) during the violence module. These logistical factors may make women less likely to disclose in face-to-face surveys due to fear of partners or other household members overhearing, especially if there is high interest or attention to the interview. The second group of factors are motivated by qualitative work in study locations and include two indices of individual attitudes and perceived community norms supporting IPV and sexual violence aggregating 17 questions answered on Likert scales (Perrin et al., 2019). We hypothesize participants facing logistical constraints to disclosure will be both more likely to experience VAWG on average, and *more likely* to disclose when administered ACASI as compared to face-to-face modules (thus we expect interaction terms to be positive). In addition, if VAWG is accepted and normalized, participants may be more likely to experience VAWG on average, but with less stigma attached to it, thus this sample is *less likely* to drive increased disclosure (thus we expect interaction terms to be negative) (Humbert et al., 2021). For both set of factors, we transform indices into z-scores, standardized to the face-to-face group for ease of interpretation. Annex Table A3 provides more detailed description of these indicators and details on aggregation.

Summary statistics and balance tests

Table 1 shows balance by randomization to ACASI or face-to-face administration by background characteristics of participants. The sample is approximately 24 years old, with the largest age group among adolescents aged 15 to 19 (31 percent) and the remaining age groups with 21 to 25 percent of the sample. Approximately 44 percent of the sample has never attended school, and the majority ethnicity is Pular, followed by Wolof and Serer. The average household size is 11 members and 84 percent of the sample is currently partnered or had a partner in the last 12 months, while 72 percent of the sample has a currently cohabiting partner. Across the 20 variables representing background characteristics and factors affecting disclosure, all show good balance. Based on these results, we conclude the randomization to survey administration mode was successful and the experiment is likely to have high internal validity.

[Table 1 here]

Results

Figure 2 summarizes mean differences in reporting between face-to-face (blue bars) and ACASI (pink bars) methods, showing means and 90 percent confidence intervals. Results indicate that in all cases ACASI reporting of VAWG is significantly higher than face-to-face methods, these differences range from 3.7 pp (sexual) to 7.2 pp (physical and/or sexual) for IPV and from 6.1 pp (physical) to 11.7 (sexual harassment or violence) for VAWG measures. While categories are not directly comparable, in general, prevalence is higher for VAWG measures as compared to IPV, which reflects a broader set of perpetrators and environments where violence may occur. For our preferred measures of any physical and/or sexual violence, these differences equate to a 39 percent increase in prevalence for IPV and a 23 percent increase in prevalence for non-partner VAWG among participants using ACASI.

Table 2 gives details underlying these figures, showing that differences in reporting between ACASI and face-to-face are highly statistically significant even when controlling for enumerator fixed

effects and a broader set of control variables (columns 6a/6b). In most cases, differences decrease slightly when additional controls are added—indicating that these factors may explain some of the differences in reporting between the two modalities. For example, differences are slightly lower for any IPV (5.6 pp versus 7.2 pp) and any VAWG (8.6 pp versus 10.7 pp) in the adjusted model. Across groups of measures, the difference in reporting across the ACASI and face-to-face groups is largest among the least common type of violence. For example, ACASI reporting is 18 percent higher than face-to-face for lifetime emotional IPV, but 58 percent higher for lifetime sexual IPV. We interpret this as women reacting to privacy and confidentiality of the ACASI method by disclosing more stigmatizing information, rather than simply responding at higher rates to different survey question.

Table A4 illustrates how the 15 individual questions making up the outcome any physical and/or sexual IPV contribute to these differences. While most individual indicators are significant, this is not always the case, particularly when control variables are added. In addition to our primary questions, Table 2 also reports auxiliary violence questions around help seeking and bystander intervention. Similar to the main experience measures, we see significant increases in reporting for all measures in the ACASI sample. Women are more likely to report willingness to intervene (73 percent versus 69 percent), having previously disclosed (23 percent versus 12 percent) and having tried to get help (17 percent versus 3 percent) when assigned to ACASI administration.

[Figure 2 and Table 2 here]

Annex Table A5 replicates these results for continuous violence measures and Table A6 for 12-month measures. Both tables show very similar patterns, whereby ACASI reporting is significantly higher than face-to-face reporting. Table A5 shows that participants randomized to ACASI report anywhere from 0.150 to 0.275 standard deviation (SD) increases in violent acts as compared to face-to-face measures. The measure of combined physical and/or sexual IPV acts show differences of approximately 0.266 SDs in unadjusted models, and approximately 0.222 SDs in adjusted models, which are similar to magnitudes

for physical and/or sexual VAWG. Figure A3 shows the distribution of combined acts for IPV and VAWG as cumulative distribution plots—showing that for each 'count' of violent acts, the distribution of the ACASI sample shifted right in comparison to the face-to-face sample (signaling a higher cumulative distribution of acts). Table A7 shows that overall the 12-month prevalence of violence is substantially lower than lifetime violence, however, the main results mirror those presented in Table 2, with the exception of emotional IPV. Finally, Table A7 shows TOT results, instrumenting actual completion of the ACASI module with the randomized assignment. Results show differences are slightly larger than those show in Table 2: for any IPV (any VAWG), unadjusted differences are 8.9 pp (12.0 pp).

Table 3 reports results from analysis exploring factors hypothesized to be correlated with disclosure, focusing on lifetime measures of physical and/or sexual IPV and VAWG. For each group of factors, we report the overall measure (followed by disaggregated components), including both the coefficient of the variables alongside the coefficient of the interaction term with ACASI from separate regressions. While overall measures show significant correlations with lifetime violence outcomes (columns 1a and 2a), in no case are interaction terms significant (columns 1b and 2b). In particular, although we confirm that participants facing logistical constraints and who live in settings with attitudes and norms supporting VAWG are generally more likely to report violence—they are equally likely to disclose regardless of mode of survey administration. We replicate results for continuous measures of violent acts, as well as for attitude and norm measures aggregated to the village level, however find very similar results (thus do not report them).

[Table 3 here]

Discussion and conclusions

We conduct a survey experiment in rural Senegal randomly varying whether women and adolescent girls complete a violence module administered by enumerators face-to-face or through ACASI. We find increased reporting of lifetime IPV (ranging from 3.7 to 7.2 pps), as well as lifetime non-partner VAWG

(ranging from 6.1 to 11.7 pps) for respondents randomized to ACASI. These same patterns are observed for auxiliary measures of IPV, including willingness to intervene and help seeking, as well as for scales of violent acts and 12-month measures of violence experience. Our results add to existing evidence from the Africa region that find variable results, showing higher prevalence among ACASI groups as compared to face-to-face measures, for some, but not all samples and measures of IPV (Cullen, 2022; Park et al., 2022). In our sample, we find strong patterns suggesting higher prevalence in ACASI across outcomes, including non-partner VAWG. We find few significant correlates of increased reporting via ACASI in our sample, which differs from previous studies. The lack of identified correlates may indicate that we have not collected meaningful background characteristics for this setting, or that other unobservable or other unmeasured operational factors might be driving increased disclosure. For example, participants may be influenced by how fearful they are of adverse reactions by partners, how comfortable they feel with enumerators (including if they feel enumerators are empathetic or open to their responses) or if they have previously discussed or disclosed violence to family members or friends.

Overall, our analysis suggests that similar surveys in Senegal that collect face-to-face measures of VAWG may be at risk of severely under-reporting. For example, our study finds rates of lifetime physical and/or sexual IPV that are double the prevalence as compared to the most recent nationally-representative data (23 percent versus 13 percent) (Table A8) (ANSD & ICF, 2020). Rates are consistently larger in our study when we limit the DHS to a sample of more comparable women (aligning age group and rural residence). The under-reporting of national data may lead to underinvestment in VAWG prevention, especially when viewed in comparison to other settings which might have 'higher' official figures. Moreover, it may lead to incorrect conclusions from impact evaluations if under-reporting weakens the power of studies to detect impacts or if underreporting is non-random. In cases where surveys aim to measure impacts of evaluations which might increase disclosure in the first instance (as is the case for social norms interventions), the cost of under-reporting may be high. In these cases, interventions may increase disclosure rates in treatment groups, leading to the inability to conclude if the intervention increased violent behavior—or just increased disclosure of violence more generally.

We believe how ACASI is developed and how survey logistics are handled will have implications for accuracy of data and success of self-interviewing techniques. For example, acknowledging that our sample was rural and a meaningful proportion of women and girls had never been to school, we built in practice (test) questions and allowed for participants to 'opt-out' of ACASI if they did not feel comfortable. In practice, approximately 16 percent of the sample originally randomized to ACASI was re-directed to face-to-face interviews, either because they were not able to complete test questions correctly, or because they indicated preference not to continue. Table A10 shows the women and girls who switch to face-to-face interviews are on average older, more likely to be partnered, have lower education levels, have lower household wealth and vary on a number of other background characteristics. This indicates that planning and flexibility may be needed to accommodate cases in which respondents may not be willing or able to accurately complete ACASI on their own. A process evaluation in the DRC and Ethiopia find similar results that indicated high acceptability and understanding of ACASI, yet still included a minority sample which had comprehension challenges (90 percent of girls in DRC and 75 percent of girls in Ethiopia stated ACASI was 'easy to understand') (Falb et al., 2017). ACASI implementation also requires substantial up-front investment in terms of coding and additional supplies (headphones, cleaning agents for tablets if interviewing during COVID-19 etc.) (Falb et al., 2017). Finally, we note that ACASI comes with a time cost—participants who completed the ACASI module (one of 16 modules in the survey) spent on average 4 minutes longer than face-to-face interviews, an increase of 8 percent in the total survey time. These factors indicate that ACASI requires advanced planning and careful attention to survey implementation to ensure modules are well suited for the target population.

There are also trade-offs between ACASI and face-to-face methods in terms of data completeness and detail of information that is collected. In our survey, we opted not to ask follow-up questions about the frequency of experiencing different acts (as is common in the DHS) or ask about type of perpetrator for non-partner VAWG, as we assessed these to include too many options or complex responses to ensure accuracy. We weighted this trade-off in detail against the benefits of simpler measures in ACASI that

could increase disclosure. Mode of data collection may also affect the occurrence of "don't know or refuse" responses. In our study, overall rates were low (1.6 percent for IPV measures), however ACASI nearly doubled these rates. While suggestive, this could be because women and girls could more easily opt out of answers without pressure from enumerators. This option might be welcome for participants, however, should be weighed against concerns around data completeness.

Although the vast majority of research examining the role of survey administration indicates that there is higher disclosure of violence via private methods, there is still little research validating accuracy of either method to understand trade-offs across methods, target groups, and locations. Additional analysis is warranted on what aspects of face-to-face interviews might reduce disclosure in the first instance—if it is fear that responses will be overheard by others, concern that responses may have broader repercussions for women or perpetrators or interview fatigue, among others.[5] Qualitative methods or survey experiments may be well suited to answer these questions. Finally, additional guidance around ethical protocol appropriate for ACASI survey administration is needed (Peterman et al., 2022). In our study, similar ethical protocols were followed for both face-to-face and ACASI, as survey work required preparation for both modalities. However, it is not clear if mode of interviewing has implications for future uptake of services or negative (positive) emotional reactions that might be associated with surveys, or if studies would seek to streamline some aspects of ethics if no direct interaction with participants required asking about violence via interviewers.

While measurement of some types of violence, including IPV, has been established for decades—there is high need for additional ethical experimentation to improve the accuracy of measurement. In addition to a tendency to under-report due to stigma and shame, survivors of severe violence may block out or fail to remember traumatic events, or the specific time period when such events occurred. In addition, no standardized scales exist for some forms of violence, including economic coercion or sexual

[5] Violence modules are often placed at the end of the survey, as to increase rapport between interviewer and participant over the course of the interview and maximize potential for privacy. However, this may also lead to under-reporting if participants understand the interview time will shorten with fewer 'yes' answers that lead to follow-up questions.

harassment and warrant further testing and validation (Ranganathan et al., 2021; Yount et al., 2022). Moreover, outcome measures still tend to be one-dimensional (binary prevalence measures), obscuring our understanding of changes in frequency, severity and dynamism over time (Boyer et al., 2022). While indirect methods to solicit experience of violence have become more popular in recent years, including list randomization, there are still outstanding questions as to the accuracy and utility of these types of measures (Cullen, 2022; Gilligan et al., 2021; Peterman, 2021; Peterman et al., 2018). Ethical experimentation can spur progress towards more accurate data collection of measures, and more effective policy and program action to reduce VAWG.

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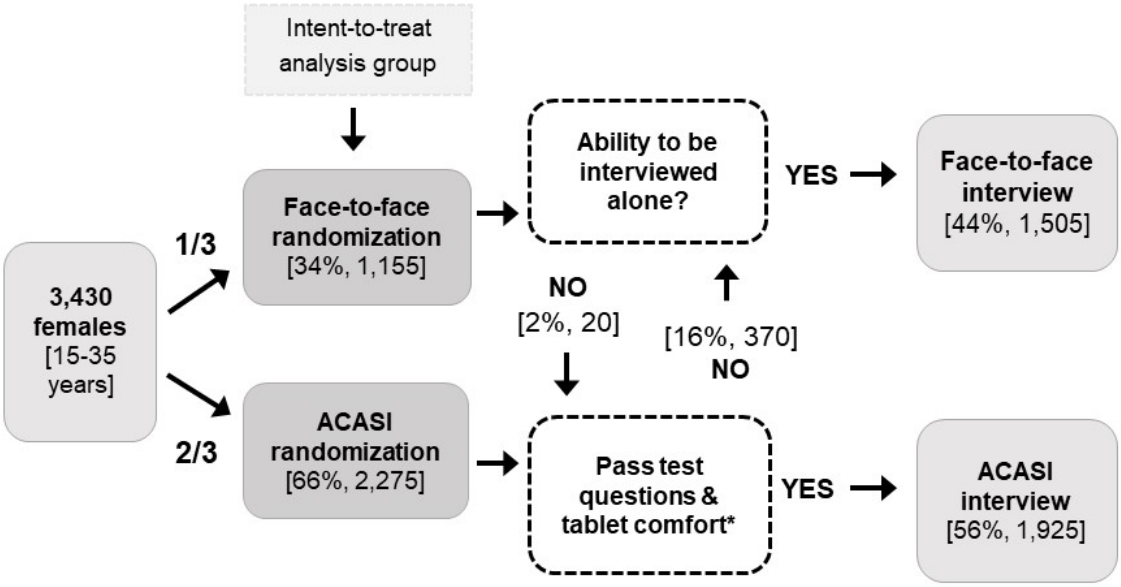
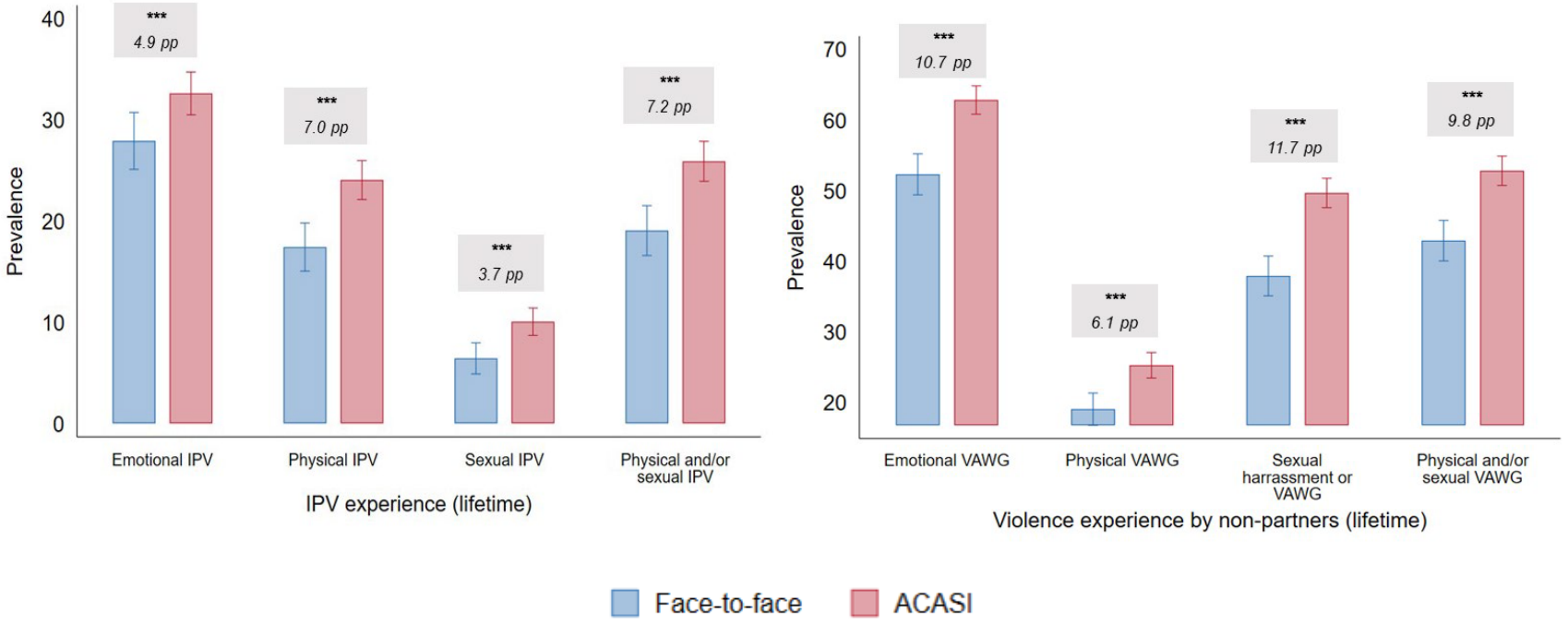
Figures in text

Figure 1: Assignment of survey administration mode (face-to-face versus audio computer-assisted self-interviews, ACASI)



* Three test questions: Pass rates were 94-98% per question – e.g., *"Is Macky Sall the president of Senegal?"*

Figure 2. Mean differences in reporting between ACASI and face-to-face administered violence indicators



Notes: ACASI = Audio computer-assisted self-interviews; IPV = intimate partner violence; VAWG = Violence against women and girls; Bars are mean value with 90 percent confidence interval bars, differences are reported from Wald tests on the equality of means of randomization to either ACASI or face-to-face interviews for each outcome with clustered standard errors at the village level. * = p<0.10, ** = p<0.05, *** = p<0.01. Standard errors are clustered at the village level. See Table 2 for detailed statistics and Table A3 for full descriptions of indicators.

Table 1. Balance in background variables and predictors between ACASI and face-to-face samples

	All	ACASI	Face-to-face	P-value from difference
Age splines	(1)	(2)	(3)	(2)-(3)
Age 15-19 years	0.308	0.312	0.300	0.481
Age 20-24 years	0.246	0.240	0.257	0.280
Age 25-29 years	0.210	0.204	0.223	0.232
Age 30-35 years	0.235	0.243	0.220	0.082
Education level				
Never attended school	0.444	0.444	0.445	0.955
Completed or some primary	0.279	0.281	0.275	0.763
Completed or some secondary	0.275	0.273	0.278	0.802
Ethnicity				
Wolof	0.305	0.300	0.316	0.316
Pular	0.452	0.451	0.454	0.861
Serer	0.153	0.154	0.151	0.760
Other	0.090	0.095	0.080	0.140
Demographics				
Currently or previously partnered (last 12-months)	0.844	0.838	0.855	0.166
Household size	11.164	11.172	11.147	0.887
Factors affecting disclosure				
Logistical factors discouraging disclosure (z-score)	-0.021	-0.029	-0.004	0.465
Partner is currently cohabiting	0.719	0.723	0.711	0.386
Crowding (household size / rooms)	2.790	2.769	2.829	0.135
Interruptions due to partner or other adult male (0-4)	0.096	0.092	0.104	0.412
Attitudes and norms supporting VAWG (z-score)	0.033	0.049	0.002	0.210
Attitudes supporting VAWG	13.477	13.569	13.295	0.203
Norms supporting VAWG	14.658	14.738	14.500	0.403
Sample size	3,430	2,275	1,155	

Notes: ACASI = Audio computer-assisted self-interviews; VAWG = Violence against women and girls; P-values are reported from Wald tests on the equality of means of randomization to either ACASI or face-to-face interviews for each variable. Standard errors are clustered at the village level. See Table A3 for full descriptions of indicators.

Table 2. Differences in disclosure of lifetime VAWG in ACASI and face-to-face samples

		Sample means			Regression analysis of differences (ACASI)			
	N	All	Face-to-face	ACASI	Coefficient [unadjusted]	P-value	Coefficient [adjusted]	P-value
Intimate partner violence (ever partnered sample)	(1)	(2)	(3)	(4)	(5a)	(5b)	(6a)	(6b)
Emotional IPV	2,892	0.312	0.279	0.328	0.049	*0.004*	0.042	*0.015*
Physical IPV	2,895	0.219	0.173	0.243	0.070	*0.000*	0.055	*0.001*
Sexual IPV	2,896	0.088	0.064	0.101	0.037	*0.001*	0.028	*0.014*
Physical and/or sexual IPV	2,891	0.237	0.189	0.262	0.072	*0.000*	0.056	*0.001*
Non-partner violence against women (full sample)								
Emotional VAWG	3,393	0.594	0.523	0.630	0.107	*0.000*	0.086	*0.000*
Physical VAWG	3,405	0.229	0.189	0.250	0.061	*0.000*	0.050	*0.001*
Sexual harassment or VAWG	3,401	0.455	0.377	0.494	0.117	*0.000*	0.104	*0.000*
Physical and/or sexual VAWG	3,398	0.494	0.428	0.527	0.098	*0.000*	0.082	*0.000*
Auxiliary violence measures								
Would intervene in the case of physical IPV	3,430	0.720	0.694	0.733	0.038	*0.030*	0.040	*0.016*
Told anyone about IPV (12 months)	2,915	0.190	0.118	0.228	0.110	*0.000*	0.107	*0.000*
Tried to get help to stop IPV (12 months)	2,915	0.122	0.032	0.169	0.137	*0.000*	0.131	*0.000*

Notes: ACASI = Audio computer-assisted self-interviews; IPV = intimate partner violence; VAWG = Violence against women and girls; Reported coefficients and p-values are reported from separate regressions of violence outcomes on an indicator for being randomized to ACASI. Standard errors are clustered at the village level. Control variables used in columns (6a/6b) are: age splines, education levels, ethnicity indicators, household size, the household food insecurity access scale and enumerator fixed effects. See Table A3 for full descriptions of indicators.

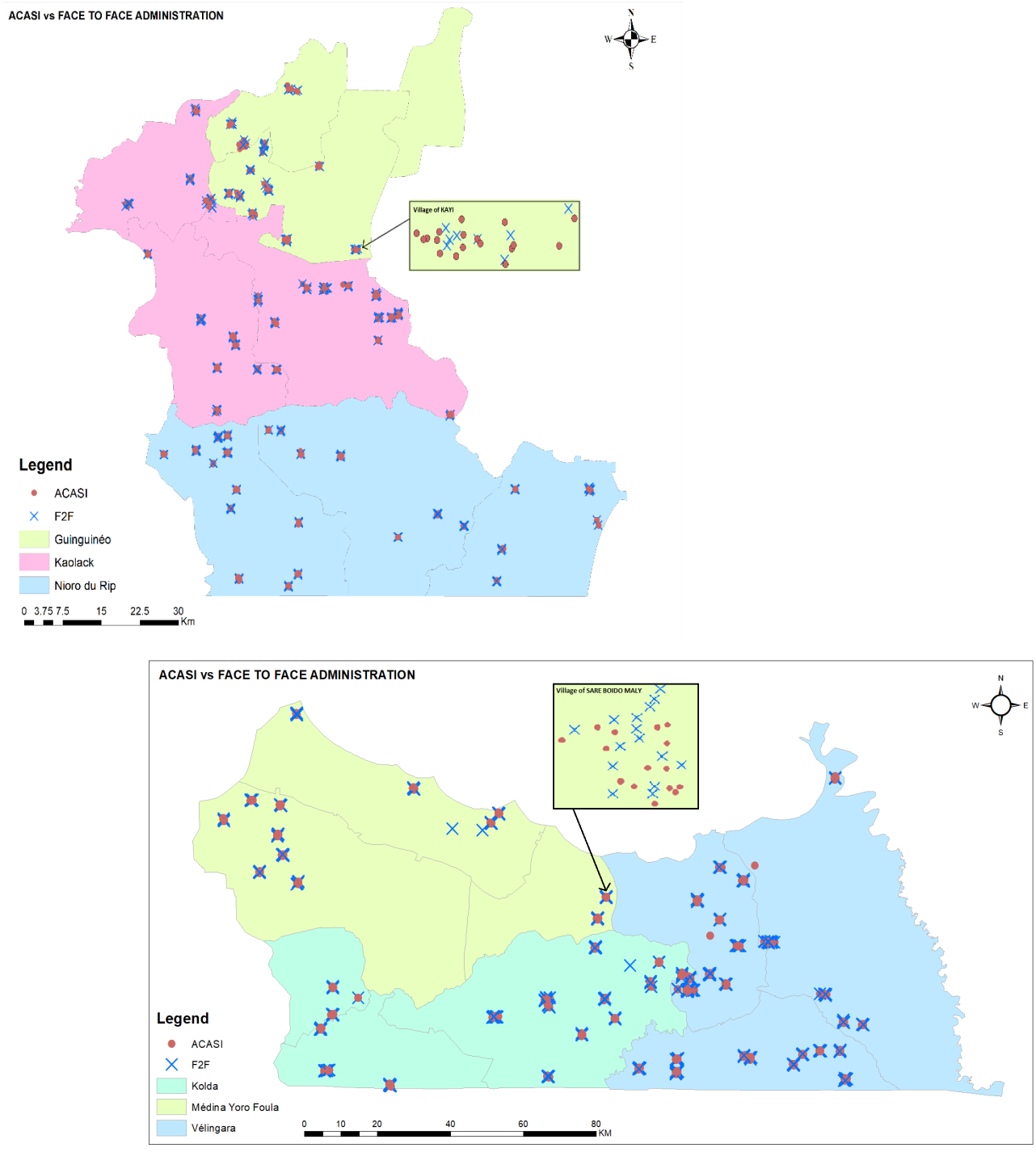
Table 3. Factors correlated with increased reporting of lifetime VAWG measures in ACASI

	Physical and/or sexual IPV		Physical and/or sexual VAWG	
	Coefficient control variable	Coefficient control x ACASI	Coefficient control variable	Coefficient control x ACASI
Factors affecting disclosure (z-scores)	(1a)	(1b)	(2a)	(2b)
Logistical factors discouraging disclosure	0.04	-0.02	-0.01	0.01
	(0.01)***	(0.02)	(0.02)	(0.02)
Partner is cohabiting	0.05	-0.02	-0.03*	0.01
	(0.01)***	(0.01)	(0.01)	(0.02)
Crowding index	0.01	-0.02	-0.02	0.01
	(0.01)	(0.01)	(0.02)	(0.02)
Interruptions during violence module	0.01	0.01	0.03	-0.01
	(0.01)	(0.02)	(0.02)*	(0.02)
Attitudes and norms (z-scores)				
Attitudes and norms supporting VAWG	0.08	0.01	0.10	-0.03
	(0.02)***	(0.02)	(0.02)***	(0.02)
Attitudes supporting VAWG	0.04	0.02	0.05	-0.02
	(0.02)***	(0.02)	(0.02)***	(0.02)
Norms supporting VAWG	0.08	0.01	0.10	-0.03
	(0.02)***	(0.02)	(0.02)***	(0.02)
N	2,891		3,398	

Notes: ACASI = Audio computer-assisted self-interviews; VAWG = Violence against women and girls;; Coefficients are from separate estimates regressing violence outcomes on each control variable (group) and its interaction with ACASI. Standard errors are clustered at the village level. See Table A3 for full descriptions of indicators.

Appendix material

Figure A1. Map of study regions and survey administration randomization (top: Kaolack, bottom: Kolda)



Source: Authors own calculations based on primary survey data (collected in 2020-2021)

Figure A2. ACASI tablet screen examples

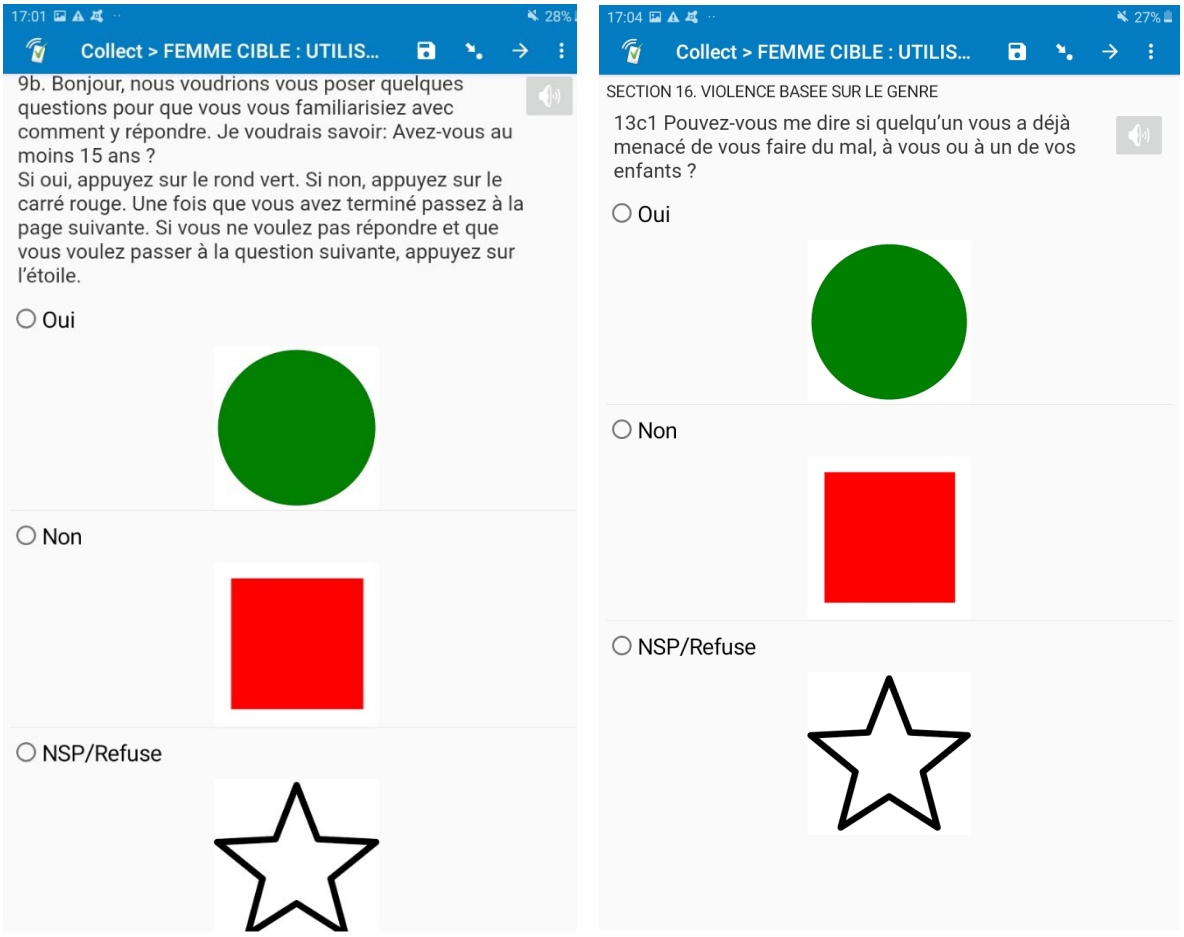
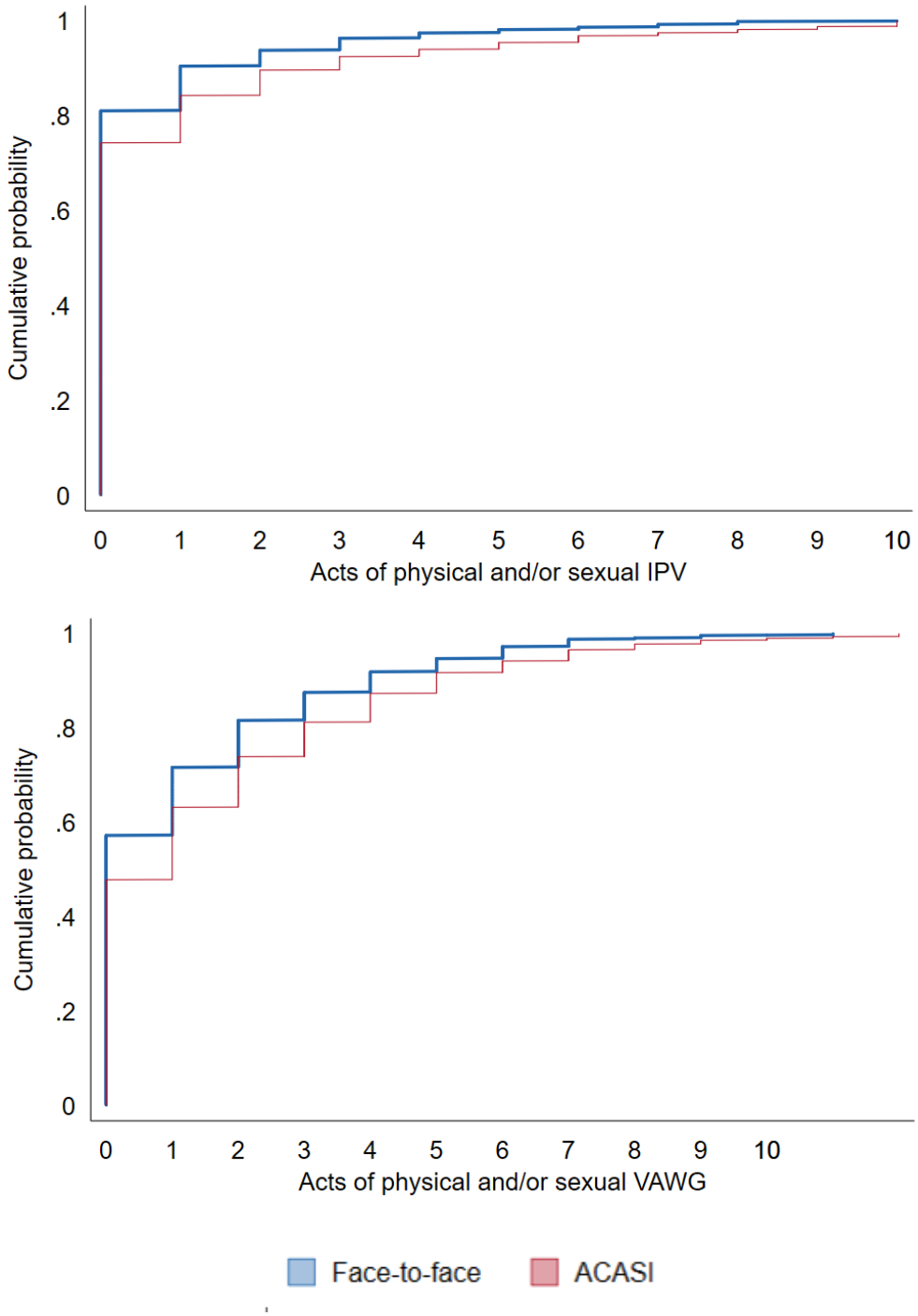


Figure A3. Cumulative distribution plots of violence acts (summary indicators) by survey administration



Notes: ACASI = Audio computer-assisted self-interviews; IPV = intimate partner violence; VAWG = Violence against women and girls; Lines show the cumulative distribution of violence acts for IPV and VAWG by randomization to either ACASI or face-to-face interviews for each outcome. * = p<0.10, ** = p<0.05, *** = p<0.01. Standard errors are clustered at the village level. See Table A3 for full descriptions of indicators.

Table A1. Evidence on the role of survey administration on measures of violence against women and adolescent girls

Authors (year)	Setting	Sample	VAWG measure(s)	Survey administration	Main finding(s)
Assefa et al. (2022) †	Ethiopia	637 women	Controlling behaviors (index of 10 items related to mobility)	Face-to-face (male) vs. phone (male) vs. phone (female)[1]	• Women are equally likely to indicate they have freedom of movement with male and female enumerators (conditional on a phone interview) • Women are 0.23 SDs less likely to state they have freedom of movement over the phone (conditional on a male enumerator)
Barr et al. (2017)*	Uganda	3,842 adolescents aged ~13-14 years	Forced sex (1+ items)	Sealed envelope vs. face-to-face	• Sealed envelope method resulted in significantly higher disclosure (7.1%) as compared to face-to-face methods (1.1%)
Cullen (2022)*	Rwanda	1,855 women aged ≥ 18 years 1,851 men aged ≥ 18 years	Non-partner sexual violence (1 item); physical IPV (1 item) Emotional IPV perpetration (2 items)	Face-to-face vs. ACASI	• ACASI associated with 3 pp increased report of sexual violence; no significant difference for physical IPV • ACASI associated with 20 pp increased report of limiting family contact; no significant difference for threating to hurt wife or someone close to her
Park et al. (2022) †	Liberia Malawi	1,261 women (age range NR) 1,737 women (age range NR)	Controlling behaviors, emotional, physical, sexual and combined IPV (20 items)	Face-to-face vs. ACASI	• ACASI associated with 7 pp higher on index of controlling behaviors and 8 pp higher on index of sexual IPV; no significant difference on emotional, physical or combined IPV • ACASI associated with higher values on all indices: controlling behaviors (18 pp), emotional IPV (10 pp), physical IPV (5 pp), sexual IPV (6 pp), any IPV (13 pp)
Punjabi et al. (2021) †	Uganda	854 students (half P5 level, mean age 12 years & half P7 level, mean age 14)	Sexual violence, corporal punishment & bullying	Face-to-face vs. ACASI	• Sexual violence: Higher reporting in ACASI (77.3% vs. 43.3) • Corporal punishment: Higher reporting in ACASI (95.9% vs. 92.8%) • Bullying: No significant differences (97.1% vs. 96.0%)

Rathod et al. (2011)*	India	464 women aged 18 to 26 years	Physical IPV (1 item)	Face-to-face vs. ACASI	• ACASI associated with lower reporting (RR = 0.61 and 0.74 at wave 1 and wave 2)
Stark et al. (2017)*	Ethiopia	165 adolescent girls aged 10 to 19 in refugee camps	Prevalence & perpetrators of physical, sexual & emotional violence	ACASI vs. qualitative group discussions	• Group-based qualitative narratives focused on violence perpetrated by strangers or community members, while ACASI revealed violence predominantly by intimate partners and family members
van der Elst et al. (2009)*	Kenya	139 female sex workers aged 22-35 years	Rape (1 item)	Face-to-face vs. ACASI	• No significant difference by survey administration

Notes: * = journal publication; † = working paper, pre-print or research brief; ACASI = audio computer-assisted self-interview; IPV = intimate partner violence; NR = not reported; RR = risk ratio; SD = standard deviation.

1/ In addition, some respondents were randomly assigned to have more frequent interaction with enumerators over the phone as part of a different treatment, thus authors are able to isolate the effects of increased rapport—however there are no significant effects of this additional treatment either among the full sample or among female enumerators on freedom of movement.

Table A2: ACASI screening test questions (n = 2,258)

Question		Correct response	Response [%, n]		
			Yes	No	Don't know or refused
1	Are you at least 15 years old?	Yes	0.95 [2,158]	0.04 [81]	0.02 [36]
2	Do you currently live in St. Louis?	No	0.05 [115]	0.94 [2,143]	0.01 [17]
3	Is Macky Sall the president of Senegal?	Yes	0.98 [2,221]	0.02 [48]	0.00 [6]

Summary statistics	[%, n]
All questions correct (fully passed test)	0.89 [2,036]

Notes: ACASI = Audio computer-assisted self-interviews.

Table A3: Definitions and indicator construction of key outcome and background variables

Outcome variables: Violence against women and girls indicators	
Indicator	**Description and construction of the variable**
Emotional IPV	Binary and sum indicators created from a total of 5 questions following the WHO modified conflict tactics scale with all questions responding yes, no or don't know/refuse. Please tell me if these apply to your relationship (past relationship) with your husband or partner: *1) He (does/did) things to scare or intimidate you on purpose, by the way he looked at you, by yelling or smashing things?, 2) He (does/did) not trust you to spend money?, 3) said something to humiliate you in front of others, 4) He (threatens/threatened) to hurt or harm you or someone that you care about? 5) He (insults/insulted) you or made you feel bad about yourself ?* All questions are coded = 1 if any response is yes. All questions are coded as missing if any item is "don't know/refuse" and all other items are responded as no or if all questions are "don't know/refuse."
Physical IPV	Binary and sum indicators created from a total of 7 questions following the WHO modified conflict tactics scale with all questions responding yes, no or don't know/refuse. Please tell me if these apply to your relationship (past relationship) with your husband or partner, did he ever: *1) Push you, shake you, or throw something at you ?, 2) Slap you ?, 3) Twist your arm or pull your hair ?, 4) Punch you with his fist or with something that could hurt you ?, 5) Kick you, drag you, or beat you up?, 6) Try to choke you or burn you on purpose ?, 7) Threaten or attack you with a knife, gun, or sharp object or other weapon ?* All questions are coded = 1 if any response is yes. All questions are coded as missing if any item is "don't know/refuse" and all other items are responded as no or if all questions are "don't know/refuse."
Sexual IPV	Binary and sum indicators created from a total of 3 questions following the WHO modified conflict tactics scale, with all questions responding yes, no or don't know/refuse. Please tell me if these apply to your relationship (past relationship) with your husband or partner, did he ever: *1) physically forced you to have sexual intercourse with him when you did not want to), 2) Physically force you to perform any other sexual acts you did not want to?, 3) Force you with threats or in any other way to perform sexual acts you did not want to?* All questions are coded = 1 if any response is yes. All questions are coded as missing if any item is "don't know/refuse" and all other items are responded as no or if all questions are "don't know/refuse."
Physical and/or sexual IPV	Combination of physical IPV and sexual IPV aggregates, coded as missing if either aggregate is missing.
Emotional VAWG	Binary and sum indicators created from a total of 6 questions, with all questions responding yes, no or don't know/refuse. Has anyone ever: *1) Screamed at you, either when you were alone or in front of others ?, 2) Excessively criticized you or insulted you, ether when you were alone or in front of others?, 3) Threatened to hurt you or one of your children ?, 4) Spread false rumors about you or one of your children?, 5) Ignored you and refused to talk to you, intentionally left you out or did not allow you to do things you wanted to ?, 6) Taken or stolen, broke or ruined your belongings?* All questions are coded = 1 if any response is yes. All questions are coded as missing if any item is "don't know/refuse" and all other items are responded as no or if all questions are "don't know/refuse."
Physical VAWG	Binary and sum indicators created from a total of 4 questions, with all questions responding yes, no or don't know/refuse. Has anyone ever: *1) Forced you to work excessively against your will ?, 2) Withheld food from you, did not allow you to eat, starved you, or forced you to eat things that you*

	did not want to?, 3) Slapped you, pushed or punched you, shook you, or throw something at you, pushed you, grabbed your arm, pulled your hair, crushed your fingers or hands, punched or kicked you?, 4) Beat you or attacked you with a weapon, cut you, dragged you, tried to strangle or suffocate you or burned you? All questions are coded = 1 if any response is yes. All questions are coded as missing if any item is "don't know/refuse" and all other items are responded as no or if all questions are "don't know/refuse."
Sexual harassment and VAWG	Binary and sum indicators created from a total of 8 questions, with all questions responding yes, no or don't know/refuse. Has anyone ever: *1) Whistled, called or hooted at you in a sexual way?, 2) Made gestures or used body language of a sexual nature which embarrassed or offended you?, 3) Made sexual comments or offensive remarks about your appearance, body or sexual stories or jokes that were offensive?, 4) Stared, leered or ogled you in a way that made you feel uncomfortable?, 5) Touched you in a way that made you feel uncomfortable or exposed themselves in front of you in a way that made you feel uncomfortable?, 6) Made unwelcome attempts to establish a romantic or sexual relationship with you—despite your efforts to discourage it?, 7) Tricked, threatened or blackmailed you, or physically forced you to have sexual intercourse when you did not want to ?, 8) Tricked, threatened or blackmailed you, or physically forced you to perform any other sexual acts you did not want to, including forcing you to kiss them or touch yourself ?* All questions are coded = 1 if any response is yes. All questions are coded as missing if any item is "don't know/refuse" and all other items are responded as no or if all questions are "don't know/refuse."
Physical and/or sexual VAWG	Combination of physical VAWG and sexual harassment and VAWG aggregates, coded as missing if either aggregate is missing.
Factors affecting disclosure	
Indicator	**Description and construction of the variable**
Logistical factors related to disclosure	Equally weighted z-score index comprised of the following individually standardized indicators with respect to the face-to-face administered group: 1) Indicator of if partner is currently co-habiting 2) Crowding (household size divided by the number of sleeping rooms in the dwelling) 3) Index of interruptions during the violence module, defined as if enumerator recorded one interruption (coded = 1) or two or more interruptions (coded = 2) because of an adult trying to listen, come into the room or interfere in the interview in any way. Indicators for husband / partner and any other adult male are aggregated into a scale ranging from 0 - 4.
Attitudes and norms towards VAWG	Equally weighted z-score index comprised of the following indices following Perrin et al. 2019's 'Social norms and beliefs about gender based violence scale' (coded such that more favorable attitudes and norms are lower): 1) Sexual violence attitudes: Equally weighted index from 5 questions from the personal beliefs on response to sexual violence sub-scale – with response options: 1 (agree), 2 (not sure if I agree or disagree), 3 (disagree, but am not ready to tell others), and 4 (disagree and would be willing to tell others): *1) "Husbands should abandon/reject/divorce their wife if she reports that she has been raped"; 2) "A man should have the right to demand sex from a woman or girl even if he is not married to her"; 3) "A woman/girl would be stigmatized if she were to report sexual violence"; 4) A woman/girl should be blamed when she has been raped" and 5) "Families should ignore/reject a daughter if she reports that she has been raped"* 2) IPV attitudes: Equally weighted index created from 4 questions from the personal beliefs on husbands right to use violence sub-scale – with response options: 1 (agree), 2 (not sure

	if I agree or disagree), 3 (disagree, but am not ready to tell others), and 4 (disagree and would be willing to tell others): 1) "*It is okay for a husband to beat his wife to discipline her",* 2) *When a man beats his wife, he is showing his love for her"*; 3) "*A man has the right to beat/punish his wife"* and 4) "*A husband should force his wife to have sex when she does not want to."* 3) Sexual violence norms: Equally weighted index from 4 questions social norms on response to sexual violence sub-scale – with response options: 1 (none of them), 2 (a few of them), 3 (about half of them), 4 (most of them) and 5 (all of them): 1) *"How many of the people whose opinion matters most to you expect a husband to abandon his wife if she reports that she has been raped?*"; 2) "*How many of the people whose opinion matters most to you expect the family to ignore/reject a daughter if she reports that she has been raped?*"; 3) "*How many of the people whose opinion matters most to you accept sexual violence against women and girls a normal part of life?*" and 4) "*How many of the people whose opinion matters most to you blame women/girls when they are raped?"* 4) IPV norms: Equally weighted index from 4 questions from the personal beliefs on husbands right to use violence sub-scale of the – with response options: 1 (none of them), 2 (a few of them), 3 (about half of them), 4 (most of them) and 5 (all of them): 1) "*How many of the people whose opinion matters most to you think that when a man beats his wife, he is showing his love for her?*"; 2) "*How many of the people whose opinion matters most to you think that a man has the right to beat/punish his wife?*"; 3) "*How many of the people whose opinion matters most to you think it is okay for a husband to beat his wife to discipline her?*"; 4) "*How many of the people whose opinion matters most to you expect a husband to force his wife to have sex when she does not want to?*"

Notes: IPV = intimate partner violence; VAWG = Violence against women and girls.

Table A4. Differences in disclosure of lifetime IPV in ACASI and face-to-face samples for individual physical and/or sexual indicators

		Sample means			Regression analysis of differences (ACASI)			
	N	All	Face-to-face	ACASI	Coefficient [unadjusted]	P-value	Coefficient [adjusted]	P-value
Intimate partner violence (ever partnered sample)	(1)	(2)	(3)	(4)	(5a)	(5b)	(6a)	(6b)
1) Does things to scare or intimidate you on purpose?	2,895	0.144	0.130	0.151	0.021	*0.117*	0.013	*0.301*
2) Does not trust you to spend money?	2,898	0.155	0.125	0.170	0.045	*0.002*	0.046	*0.001*
3) Said something to humiliate you in front of others?	2,902	0.109	0.078	0.126	0.048	*0.000*	0.041	*0.001*
4) Threatens to hurt or harm you or someone that you care about?	2,902	0.075	0.061	0.082	0.021	*0.046*	0.016	*0.119*
5) Insults you or made you feel bad about yourself?	2,899	0.111	0.097	0.118	0.021	*0.071*	0.017	*0.148*
6) Push you, shake you, or throw something at you?	2,901	0.074	0.047	0.088	0.040	*0.000*	0.035	*0.000*
7) Slap you?	2,899	0.161	0.129	0.178	0.049	*0.001*	0.035	*0.011*
8) Twist your arm or pull your hair?	2,906	0.082	0.045	0.100	0.055	*0.000*	0.049	*0.000*
9) Punch you with his fist or with something that could hurt you?	2,902	0.074	0.056	0.083	0.027	*0.004*	0.021	*0.031*
10) Kick you, drag you, or beat you up?	2,902	0.069	0.040	0.084	0.044	*0.000*	0.040	*0.000*
11) Try to choke you or burn you on purpose?	2,899	0.028	0.010	0.038	0.028	*0.000*	0.025	*0.000*
12) Threaten or attack you with a knife, gun, or sharp object or other weapon?	2,900	0.023	0.007	0.032	0.025	*0.000*	0.022	*0.000*
13) Physically forced you to have sexual intercourse with him when you did not want to?	2,902	0.068	0.054	0.074	0.020	*0.049*	0.013	*0.195*
14) Physically force you to perform any other sexual acts you did not want to?	2,905	0.052	0.033	0.062	0.029	*0.002*	0.024	*0.007*
15) Force you with threats or in any other way to perform sexual acts you did not want to?	2,901	0.043	0.023	0.054	0.031	*0.000*	0.027	*0.000*

Notes: ACASI = Audio computer-assisted self-interviews; IPV = intimate partner violence; Coefficients and p-values are reported from separate regressions of violence outcomes on an indicator for being randomized to ACASI. Standard errors are clustered at the village level. Control variables used in columns (6a/6b) are: age splines, education levels, ethnicity indicators, an indicator of if the participant is partnered, household size and enumerator fixed effects. See Table A3 for full descriptions of indicators.

Table A5. Differences in disclosure of lifetime VAWG in ACASI and face-to-face samples (continuous measures, z-score)

		Sample means			Regression analysis of differences (ACASI)			
	N	All	Face-to-face	ACASI	Coefficient [unadjusted]	P-value	Coefficient [adjusted]	P-value
Intimate partner violence (ever partnered sample)	(1)	(2)	(3)	(4)	(5a)	(5b)	(6a)	(6b)
Emotional IPV	2,880	0.098	-0.000	0.150	0.150	*0.001*	0.128	*0.004*
Physical IPV	2,886	0.181	0.000	0.275	0.275	*0.000*	0.233	*0.000*
Sexual IPV	2,895	0.110	-0.000	0.167	0.167	*0.001*	0.133	*0.007*
Physical and/or sexual IPV	2,879	0.175	0.000	0.266	0.266	*0.000*	0.222	*0.000*
Non-partner violence against women (full sample)								
Emotional VAWG	3,355	0.141	0.000	0.213	0.213	*0.000*	0.169	*0.000*
Physical VAWG	3,402	0.130	-0.000	0.197	0.197	*0.000*	0.164	*0.000*
Sexual harassment or VAWG	3,381	0.151	-0.000	0.229	0.229	*0.000*	0.192	*0.000*
Physical and/or sexual VAWG	3,371	0.165	-0.000	0.250	0.250	*0.000*	0.209	*0.000*

Notes: ACASI = Audio computer-assisted self-interviews; IPV = intimate partner violence; VAWG = Violence against women and girls; Coefficients and p-values are reported from separate regressions of violence outcomes on an indicator for being randomized to ACASI. Standard errors are clustered at the village level. Control variables used in columns (6a/6b) are: age splines, education levels, ethnicity indicators, an indicator of if the participant is partnered, household size and enumerator fixed effects. See Table A3 for full descriptions of indicators.

Table A6. Differences in disclosure of 12-month VAWG in ACASI and face-to-face samples

		Sample means			Regression analysis of differences (ACASI)			
	N	All	Face-to-face	ACASI	Coefficient [unadjusted]	P-value	Coefficient [adjusted]	P-value
Intimate partner violence (ever partnered sample)	(1)	(2)	(3)	(4)	(5a)	(5b)	(6a)	(6b)
Emotional IPV	2,882	0.224	0.218	0.227	0.009	*0.539*	0.009	*0.570*
Physical IPV	2,887	0.122	0.084	0.141	0.057	*0.000*	0.051	*0.000*
Sexual IPV	2,892	0.059	0.043	0.068	0.024	*0.008*	0.018	*0.044*
Physical and/or sexual IPV	2,883	0.138	0.099	0.158	0.058	*0.000*	0.050	*0.000*
Non-partner violence against women (full sample)								
Emotional VAWG	3,371	0.491	0.437	0.519	0.082	*0.000*	0.066	*0.000*
Physical VAWG	3,396	0.146	0.091	0.175	0.083	*0.000*	0.075	*0.000*
Sexual harassment or VAWG	3,384	0.340	0.268	0.377	0.108	*0.000*	0.098	*0.000*
Physical and/or sexual VAWG	3,382	0.370	0.292	0.410	0.118	*0.000*	0.106	*0.000*

Notes: ACASI = Audio computer-assisted self-interviews; IPV = intimate partner violence; VAWG = Violence against women and girls; Coefficients and p-values are reported from separate regressions of violence outcomes on an indicator for being randomized to ACASI. Standard errors are clustered at the village level. Control variables used in columns (6a/6b) are: age splines, education levels, ethnicity indicators, an indicator of if the participant is partnered, household size and enumerator fixed effects. See Table A3 for full descriptions of indicators.

Table A7. Differences in disclosure of lifetime VAWG in ACASI and face-to-face samples from TOT estimates

		Sample means			Regression analysis of differences (ACASI)			
	N	All	Face-to-face	ACASI	Coefficient [unadjusted]	P-value	Coefficient [adjusted]	P-value
Intimate partner violence (ever partnered sample)	(1)	(2)	(3)	(4)	(5a)	(5b)	(6a)	(6b)
Emotional IPV	2,892	0.312	0.291	0.328	0.060	*0.003*	0.053	*0.013*
Physical IPV	2,895	0.219	0.169	0.259	0.086	*0.000*	0.069	*0.000*
Sexual IPV	2,896	0.088	0.056	0.114	0.046	*0.001*	0.036	*0.012*
Physical and/or sexual IPV	2,891	0.237	0.184	0.280	0.089	*0.000*	0.070	*0.001*
Non-partner violence against women (full sample)								
Emotional VAWG	3,393	0.594	0.501	0.666	0.130	*0.000*	0.107	*0.000*
Physical VAWG	3,405	0.229	0.171	0.274	0.074	*0.000*	0.062	*0.001*
Sexual harassment or VAWG	3,401	0.455	0.346	0.540	0.143	*0.000*	0.129	*0.000*
Physical and/or sexual VAWG	3,398	0.494	0.393	0.572	0.120	*0.000*	0.102	*0.000*
Auxiliary violence measures								
Would intervene in the case of physical IPV	3,430	0.720	0.696	0.739	0.047	*0.028*	0.050	*0.014*
Told anyone about IPV (12 months)	2,915	0.190	0.115	0.251	0.135	*0.000*	0.134	*0.000*
Tried to get help to stop IPV (12 months)	2,915	0.122	0.031	0.196	0.168	*0.000*	0.164	*0.000*

Notes: ACASI = Audio computer-assisted self-interviews; IPV = intimate partner violence; TOT = treatment-on-the-treated; VAWG = Violence against women and girls; Reported coefficients and p-values are reported from separate regressions of violence outcomes on an indicator for being administered ACASI, instrumenting administration with an indicator of randomization to ACASI. Standard errors are clustered at the village level. Control variables used in columns (6a/6b) are: age splines, education levels, ethnicity indicators, an indicator of if the participant is partnered, household size and enumerator fixed effects. See Table A3 for full descriptions of indicators.

Table A8: Comparison between lifetime IPV measures in primary data and the Senegalese Demographic and Health Survey (2019)

	Survey experiment: 15 to 35 years			DHS: 15 to 49 years			
	All	ACASI	Face-to-face	Full sample	Rural only	Age group: 15 to 34 years	Rural + Age group 15 to 34 years
	(1)	(1a)	(1b)	(2a)	(2b)	(2c)	(2d)
Emotional IPV	0.312	0.328	0.279	0.099	0.103	0.091	0.096
Physical IPV	0.219	0.243	0.173	0.114	0.113	0.105	0.096
Sexual IPV	0.088	0.101	0.064	0.038	0.045	0.041	0.047
Physical and/or sexual IPV	0.237	0.262	0.189	0.131	0.129	0.124	0.119
Sample size	2,896	2,896	2,896	1,468	482	885	280

Notes: ACASI = Audio computer-assisted self-interviews; DHS = Demographic and Health Survey; IPV = intimate partner violence; Means in the DHS use domestic violence sample weights and are constructed using the 'subpop' command. DHS estimates are not representative in sub-populations and thus are illustrative only. Small differences exist between the DHS and survey experiment questions for IPV, however there is a high degree of comparability. See Table A3 for full descriptions of indicators in the survey experiment data.

Table A9. Analysis of background variables in 'switchers' from ACASI and face-to-face

	All	ACASI [implemented]	Switched to face-to-face	P-value from difference
Age splines	(1)	(2)	(3)	(2)-(3)
Age 15-19 years	0.312	0.321	0.262	0.019
Age 20-24 years	0.240	0.241	0.238	0.890
Age 25-29 years	0.204	0.203	0.211	0.724
Age 30-35 years	0.243	0.234	0.289	0.022
Education level				
Never attended school	0.444	0.424	0.549	0.000
Completed or some primary	0.281	0.280	0.284	0.897
Completed or some secondary	0.273	0.294	0.168	0.000
Ethnicity				
Wolof	0.300	0.305	0.273	0.357
Pular	0.451	0.440	0.505	0.090
Serer	0.154	0.165	0.100	0.002
Mandingue, Diola, Sonike, or other	0.095	0.090	0.122	0.338
Demographics				
Currently or previously partnered (last 12-months)	0.838	0.830	0.881	0.013
Household size	11.172	11.265	10.694	0.073
Factors affecting disclosure				
Logistical factors discouraging disclosure (z-score)	-0.021	-0.029	-0.004	0.465
Partner is currently cohabiting	0.719	0.723	0.711	0.386
Crowding (household size / rooms)	2.790	2.769	2.829	0.135
Interruptions due to partner or other adult male (0-4)	0.096	0.092	0.104	0.412
Attitudes and norms supporting VAWG (z-score)	0.033	0.049	0.002	0.210
Attitudes supporting VAWG	13.477	13.569	13.295	0.203
Norms supporting VAWG	14.658	14.738	14.500	0.403
Sample size	2,275	1,905	370	

Notes: ACASI = Audio computer-assisted self-interviews; VAWG = Violence against women and girls; P-values are reported from Wald tests on the equality of means of randomization to either ACASI or face-to-face interviews for each variable. Standard errors are clustered at the village level. See Table A3 for full descriptions of indicators.

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