EVIDENCE BASED PUBLIC HEALTH POLICY AND PRACTICE

Examining the effect of residential change on intimate partner violence risk

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J Epidemiol Community Health 2006;**60**:923–927. doi: 10.1136/jech.2006.047084

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Accepted 15 April 2006

Objectives: To examine the relationship between residential change and a woman's subsequent risk of intimate partner violence (IPV), whether by a past or a new offender, a relationship that has not been prospectively examined to date.

Design: A dynamic cohort of women who recently changed residence (movers) was compared with those who did not (non-movers) for 12-month risk of IPV by a past offender and of IPV by a new offender.

Participants and methods: Secondary analysis of a linked, longitudinal National Crime Victimization Survey dataset including 10 754 recent movers and 10 236 non-movers among women aged 18–44 years.

Results: The risk of IPV by either a past or a new offender was almost double for women who had recently moved compared with those who had not moved. This increased risk proved to be robust, as it persisted when the data were weighted and unweighted, and when the main effect was adjusted by measured covariates.

Conclusions: The apparent increase in IPV risk after residential change may be a marker of a pre-existing problem or a precursor of subsequent problems. Unlike past research that has considered residential change after abuse or as a simultaneous exposure, this study focused solely on empirically measuring the risk of IPV after a recent move. This decision has important public health ramifications: determination of IPV exposure is not always possible, whereas soliciting a woman's history of residence may be more feasible. If transience puts a woman at greater risk for victimisation by an intimate partner, increased awareness may have a vital role in protecting women who move.

The Centers for Disease Control and Prevention estimates that intimate partner violence (IPV) against women results in approximately 2 million injuries and >1000 deaths/year in the US.¹ In addition to the overt trajectory that IPV makes to increased injury and mortality of women, research over the past decade has identified numerous other health problems disproportionately experienced by IPV victims.^{2–8} Researchers have considered some predisposing influences on subsequent IPV such as separation or divorce, low income, having young children, and living in rental housing or in an urban setting.^{9–15} However, prospective measurements of these and other exposures for their effect on subsequent risk of IPV can be methodologically challenging.

Although residential change has been identified in crime and violence literature as a risk factor for victimisation,^{16–17} little is known about the effect of moving on IPV risk. Understanding the potential risk of IPV that a woman may experience after changing her residence by a past, a current or a new partner provides important information about a contextual risk factor that has been given little attention to date in research on IPV. Cross-sectional research has found that a high degree of IPV occurs among women who are separated or divorced,^{8–14} or is precipitated by feelings of estrangement and jealousy among their male partners.¹⁸ These findings suggest that a woman may experience a heightened risk of IPV by either a past or a current partner if she were to attempt to move away from him. In addition, researchers have found that “exposure-reducing” strategies by an IPV victim may increase rather than decrease the risk of escalated violence,¹⁹ suggesting that a woman's decision to move in response to IPV may not necessarily protect her from future harm.

Furthermore, a woman's decision to move may be associated with an experience of IPV. In “Behind closed doors”, longitudinal study of women experiencing IPV by Block and Skogan²⁰, it was postulated that a woman may move in direct association with her abuse. In all, 37% of the women abused by IPV in this study moved after their first interview, with most of these women moving within 6 months. Most women reported moving to escape their abusers. Other reasons for changing residence included force (eg, being thrown out or losing their residence), the desire for her own place or a better place, moving back to her family's home or moving into a treatment shelter.

This study is the first to longitudinally examine the risk of IPV victimisation by past and new offenders that may follow residential change. This study uses a prospective dynamic cohort investigation to understand the risk of IPV in the 12-month period after a woman's change in residence. The literature consistently indicates that IPV victims who leave their offender are at increased risk of victimisation by the same offender. This study builds on the literature, with the hypothesis that the risk of IPV by a past offender will be greater among women who recently changed residence than women who did not recently move. As IPV often develops in severity over time,²¹ we explored whether recent movers experience a protective effect against immediate IPV by new partners IPV, as they may initially be busy establishing themselves in a new community and forming new relationships.

Abbreviations: IPV, intimate partner violence; NCVS, National Crime Victimization Survey

METHODS

The dataset: the National Crime Victimization Survey

This study is based on a linked, longitudinal National Crime Victimization Survey (NCVS) data file compiled during the years 1996–1999, which provided the dataset for a dynamic cohort of individuals and households selected and followed over 3 years. The NCVS is the largest national survey providing extensive detail regarding crimes and victims, with limited information on perpetrators.²² The NCVS selected households for participation based on census information using a US population-based cluster-sampling method.

Members of each selected household were then interviewed every 6 months for a 3½-year period. The NCVS measures victimisations in two stages. The first stage elicits all victimisations experienced in the past 6 months. The second stage asks detailed information, including the victim-offender relationship for all victimisation reported.

Sample

The NCVS data file provided a cohort of 20 990 women aged 18–44 years with known moving status. Women aged ≥45 years were excluded because physical IPV is less common among these women. In fact, only 10 women >44 years reported IPV in this dataset. This study was not conditional on human subject approval.

MEASURES

Exposure: recent residential change

Women who reported living in the same household for >6 months at the baseline interview were categorised as non-movers. All other women were categorised as recent movers. Six months was selected as the time frame for assigning moving status to be consistent with the original interview collection periods. Once a woman was designated as a mover or non-mover her designation held, even if she moved out of her household during the study period (see Discussion).

Outcomes: IPV victimisation

Women who experienced IPV were examined for a 12-month period, beginning with each woman's initial interview (measuring past 6-month risk) and ending with her subsequent interview 6 months later. Male-perpetrated IPV victimisations included any reported victimisation during the 12-month period reported as perpetrated by a "spouse", "ex-spouse" or "boyfriend, girlfriend, ex-boyfriend or ex-girlfriend." These were further limited to only those victimisations in which the offender was identified as being male. Victimization included any reported violent crime incidents, burglaries (completed or attempted), or forcible entries (completed or attempted). Among recent movers, only IPV reported to have occurred after a woman's move, to her current household, was included.

For each victimisation reported to the NCVS, the question, "Was this the only time this offender committed a crime or made threats against you or your household?" is asked. Using this classification, all IPV victimisations could be further categorised as being perpetrated by either a past offender or a new offender. IPV victimisation that may have occurred before a woman changed residence was not measured, as this information was only available for a subset of movers and for none of the non-movers. Furthermore, information on whether the woman lived with her offender in the past, or currently, was not available.

Covariates

Several covariates were considered as potential effect modifiers or confounders, including the woman's age, education, race, ethnicity, employment, presence of a child

living in the household, and public housing. To refine the accuracy of current employment while avoiding inclusion of employment before a woman's move, a woman was considered "employed" if she responded affirmatively to being employed in the past week at the first interview, or to being employed either the past week or in the past 6 months at the second interview. Both past-week and past 6-month employment needed to be considered because of the skip patterns present in the dataset.

Any identification of a child living in the household during the 12-month study period was coded as positive for having a child in the woman's household. Finally, designated public housing was classified as "ever" or "never." As household designation could change during the study period, it was assumed that if a household ever met public housing standards, it could be considered a low-income household.

Although household income was available in this dataset, other important corrections were not available, such as individual income and the total number of individuals supported on the household income. Owing to these constraints, education and employment status coupled with public housing designation were selected to measure socioeconomic status in this study. These measures were examined in this dataset and found to accurately distinguish households with incomes above and below a \$30 000 (€ 24 900) threshold.

Data analysis

The analysis compared women recent movers with non-movers for 12-month risk of IPV by a past or a new offender. All analyses were conducted using SAS V.0.9. As the NCVS dataset was derived from multistage cluster sampling, all analyses were conducted with both unweighted and weighted counts. The weight at first interview was applied using person-weights embedded in the dataset. Univariate analyses of the covariates and bivariate analyses of each covariate by the two types of IPV outcomes (new offender and past offender) were calculated. To measure crude risk, relative risks comparing movers with non-movers were calculated for both IPV outcomes. For the weighted risk, to correct for cluster sampling, the standard errors (SEs) were adjusted using Taylor expansion approximation, applying the pseudostratum and SE computation unit codes provided by NCVS.

As occurrences of IPV in the NCVS dataset were mathematically rare (<10%), multivariate analyses were conducted using logistic regression to calculate risk IPV.²³ Independent and multiple interactions were assessed for all covariates (data not shown). Insufficient data owing to stratification precluded drawing conclusions about effect modification; consequently, interactions were not included in multivariate models. Instead, each covariate was included in a logistic model for each IPV outcome to assess for joint confounding.

RESULTS

Sample demographics

Table 1 presents the sample demographic distributions. Slightly more than half of the women were 30–44 years of age, almost 70% were non-Hispanic white and just <5% were Asian or "other" race or ethnicity. Half of the women reported having some education beyond high school and nearly 75% had some employment over the 12-month period. Approximately half of the women had at least one child living in their household during the 12-month period. Most of this sample resided in an urban area and <4% reported that their household was "ever" designated as public housing. Slightly more than half of all women studied were recent movers.

Table 1 Select demographic characteristics among women aged 18–44 years

	Total n (%*)	Weighted %
Total	20 990 (100)	100
Age (years)		
18–29	9883 (47.1)	50.9
30–44	11 107 (52.9)	49.1
Race or ethnicity		
Non-Hispanic white	14 491 (69.2)	68.1
Non-Hispanic black	2699 (12.9)	14.6
Hispanic	2782 (13.3)	12.9
Asian	877 (4.2)	3.9
Other	100 (0.5)	0.5
(Missing = 41)		
Education (years)		
<13	10 293 (49.0)	49.6
>12	10 697 (51.0)	50.5
Employed		
Yes	15 456 (74.4)	73.9
No	5330 (25.6)	26.2
(Missing = 204)		
Child in household		
Yes	9985 (50.7)	50.3
No	9687 (49.2)	49.7
(Missing = 1318)		
Urban		
Yes	17 280 (82.3)	80.9
No	3710 (17.7)	19.1
Public housing		
Ever	703 (3.4)	3.5
Never	20 287 (96.7)	96.5
Recent mover		
Yes	10 754 (51.2)	53.6
No	10 236 (48.8)	46.4

*All percentages presented in this table are of non-missing responses. Percentages may not add up to 100 due to rounding off.

Table 2 presents the sample demographics distributed across IPV types. Overall, the weighted 1-year incidence of IPV by a past offender was 0.63% and that by a new offender was 0.93%. A similar pattern of reported IPV incidence by a past or a new offender was detected across stratifications by age, race, education, employment, public housing, presence of a child in the household, and urban area. Younger women (18–29 years of age) were more likely to report IPV by either a past or a new offender. Black women reported a higher incidence of IPV than non-Hispanic white or Hispanic women. Incidence of both IPV types was proportionately higher among women with a lower educational background and those with a child in the household.

Victimisation risk among women who recently moved

The 12-month crude risk of victimisation by a past offender among recent movers compared with non-movers was computed using unadjusted relative risks (RR) and weighted RR for each type of IPV (table 3). Using the most conservative estimates, 0.86% of recent movers reported experiencing IPV by a past offender after their move within the 12-month period examined. In comparison, 0.37% of the non-movers reported IPV by a past offender during the 12-month period (RR 2.32, 95% confidence interval (CI) 1.58 to 3.42). The CI for this estimate shows that recent movers have at least a 58% increased risk of IPV by a past offender compared with non-movers.

The reported incidence of IPV by a new offender among recent movers was 1.25% compared with only 0.56% of non-movers (RR 2.25, 95% CI 1.63 to 3.09). The lower confidence bound indicates at least a 63% increased risk of IPV by a new offender among women who have recently moved compared with non-movers. When the data were weighted to adjust for sampling design and time at risk, little change and no

attenuation were noted for IPV either by a past offender or a new offender.

Multivariate modelling and hypothesis testing

To refine the crude estimates presented earlier, multivariate logistic models were assessed for both types of IPV (past offender and new offender) that controlled for each of the selected covariates (table 3). When compared with the crude estimates reported earlier, adjusting for covariates had little influence on the main effect of moving on risk of victimisation and did little to improve the standard error. For example, the weighted, adjusted risk of IPV by a past offender was only slightly lower than the weighted, unadjusted measure of association (odds ratio (OR) 2.10 and RR 2.37, respectively). The same pattern was seen for reported IPV by a new offender (weighted, adjusted OR 2.19 and weighted RR 2.49).

DISCUSSION

Women who had recently moved were found to have approximately two times the risk of IPV within 12 months of moving compared with women who did not move recently. Results were consistent across crude, weighted and adjusted estimates of risk. It was surprising to find that moving increased a woman's risk of IPV by a new offender. In fact, moving posed the same relative risk for IPV by a new offender as it did for IPV by a past offender. Perhaps moving contributed stress to a relationship and the non-abusing partner became abusive, or these women already at risk for IPV had a propensity to quickly engage with new offenders. It is also possible that IPV by a new offender was more likely to be reported than IPV by a past offender in this type of criminal victimisation survey.

As with any analysis of secondary data, the NCVS dataset presented several challenges. Firstly, the dataset provided only a vague history of IPV owing to limitations in the survey instrument design; a woman's history of IPV could only be estimated if she was currently being abused by the same partner. Unlike past research that has considered residential change after abuse,^{18–19} this study focused solely on empirically measuring the risk of IPV after a recent move. If transience puts a woman at greater risk for victimisation, increased awareness about a woman's residential status and stability may have a vital role in protecting women who move. Residential change may be used as a "red flag" to identify to healthcare providers a potential risk of IPV.

Secondly, some women did move out during the study period and their victimisation status after their move could not be ascertained. However, as a continuous-rotation national probability sample, it is assumed that for each woman who moves out of the dataset, a woman with equal victimisation experience moves into a subsequent rotation household. Therefore, women moving into their household, as identified in this study, should serve as proxies for any woman moving out. As this study did not examine the victimisation status of movers, but rather the risk of victimisation just after a move, no considerable misclassification of mover status should exist.

Similarly, for each woman, the issue of loss to follow-up for a second interview owing to a woman moving out of her household was considered for its effect on the risk ratio assumption of equal 12-month risk periods. To assess risk of IPV using actual time at risk, IPV rate ratios were also calculated. These analyses identified an even stronger effect of moving on subsequent IPV victimisation. However, the results were not presented because of restrictions of analysis. Although adjusting SEs because of the cluster-sampling method used is necessary for the calculation of CIs, this adjustment was not possible in SAS for analyses of rate ratios.

Table 2 Select demographic characteristics by known intimate partner violence status among women aged 18–44 years

	IPV by a past offender			IPV by a new offender		
	No*	% With outcome	Weighted%	No*	% With outcome	Weighted%
Total	118	0.60	0.63	173	0.88	0.93
Age (years)†						
18–29	74	0.82	0.81	101	1.12	1.17
30–44	44	0.42	0.44	72	0.68	0.69
Race or ethnicity‡						
Non-Hispanic white	84	0.62	0.65	117	0.86	0.91
Non-Hispanic black	20	0.80	0.72	32	1.29	1.29
Hispanic	11	0.43	0.47	14	0.54	0.54
Asian	3	3.19	3.37	6	6.38	6.79
Other	0	0.00	0.00	3	0.38	0.33
Education (years)‡						
<13	70	0.72	0.75	115	1.19	1.25
>12	48	0.48	0.50	58	0.58	0.61
Employed						
Yes	85	0.58	0.61	137	0.94	0.98
No	31	0.63	0.64	35	0.71	0.79
Child in household‡						
Yes	72	0.72	0.74	121	1.21	1.29
No	40	0.41	0.42	43	0.45	0.45
Urban						
Yes	96	0.60	0.61	145	0.90	0.95
No	22	0.62	0.67	28	0.79	0.85
Public housing†						
Ever	10	1.50	1.54	4	0.60	0.58
Never	108	0.57	0.59	169	0.89	0.94

IPV, intimate partner violence.

*Where both exposure and outcome are known.

†Significant χ^2 $p < 0.05$ for IPV by both past offender and new offender.‡Significant χ^2 $p < 0.05$ for IPV by a past offender.

Thirdly, a potential sampling bias identified in the literature is the restriction of NCVS and similar surveys to sampling only households and excluding institutionalised or homeless people. Research on the effect of homelessness or shelter residency on NCVS estimates has been discussed previously.¹⁰ These researchers found that a large proportion of homeless women (possibly 22–50%) reported that they were homeless because they were fleeing from IPV. Similarly, Dugan and Castro²⁴ found that a sample of incarcerated women had substantially higher rates of violent victimisation (47.1% in 6 months) than did women in the NCVS (1.4% in 6 months). It is difficult to extrapolate the effect of this sampling limitation to the comparison between movers and non-movers. It is plausible that women who are homeless or in shelters most accurately belong in the group of movers.

However, these events are fairly rare on a population basis and would probably have a small effect on the study results.

The strengths of this study include its size and longitudinal perspective. Although past research has documented that reduced residential tenure and related exposures, such as social isolation, pose an increased risk of personal victimisation^{16–17} and IPV,²⁵ these studies have been largely cross-sectional. This study is the first to longitudinally examine the risk of IPV victimisation that may follow residential change. The NCVS dataset provided a sample size large enough for IPV events to reach significance. It is important to note that although the incidence of IPV found in this study is consistent with past research using the NCVS, it is considerably lower than the incidence of IPV derived from social science research on IPV. A supplementary analysis

Table 3 Frequency and measures of association for intimate partner violence (IPV) by a past offender and IPV by a new offender comparing movers with non-movers among women aged 18–44 years*

	IPV by a past offender	IPV by a new offender
Total movers	9268	9304
n with outcome	80	116
% With outcome	0.86	1.25
Weighted % with outcome	0.89	1.33
Total non-movers	10 179	10 198
n with outcome	38	57
% With outcome	0.37	0.56
Weighted % with outcome	0.38	0.54
RR	2.32 (1.58 to 3.42)	2.25 (1.63 to 3.09)
Weighted RR	2.37 (1.58 to 3.54)	2.49 (1.77 to 3.51)
Adjusted OR*	2.06 (1.36 to 3.10)	2.02 (1.44 to 2.82)
Weighted, adjusted OR†	2.10 (1.37 to 3.20)	2.19 (1.52 to 3.15)

IPV, intimate partner violence.

*Comparison group for IPV consists of women reporting no IPV victimisation.

†Adjusting for all measured covariates: child living in the household, age, black, Hispanic, other race, education, employment, public housing, urban residence.

What this paper adds

- Past cross-sectional research has documented that reduced residential tenure and related exposures, such as social isolation, pose an increased risk of personal victimisation and intimate partner violence (IPV). This study is the first to longitudinally examine the risk of IPV victimisation that may follow residential change, considering both IPV by a partner who has abused the woman in the past and IPV by a partner who had committed no prior abuses against the woman.
- This study supports and expands on findings of earlier cross-sectional studies by identifying that women who have recently moved are at a higher risk of IPV by both past and new offenders than women who have not recently moved. The apparent increase in risk of IPV after residential change may be a marker of a pre-existing problem or a precursor of subsequent IPV problems. In either case, awareness of the potential increased risk of IPV after a move may play a meaningful part in preserving a woman's well-being.

Policy implications

- Understanding intimate partner violence (IPV) victimisation requires obtaining a broad perspective of the context in which IPV takes place.
- As residential change may serve as a marker for instability in a relationship, women identified in healthcare services as having recently moved could be potentially assessed for risk of IPV.

found that approximately 50% of the IPV victims reported injury and police contact, suggesting that this study is probably identifying more severe cases of IPV. It would be wise to consider alternative means to ascertain the effect of moving on the risk of less severe acts of IPV.

CONCLUSION

The results of this study suggest that women who move are at a higher risk of IPV than women who have not recently moved. These findings identify that residential change, whether a marker of a pre-existing problem or a precursor of subsequent problems, can play a meaningful part in preserving a woman's well-being. It has been identified that residential change may lead to a social isolation that places individuals at increased risk of victimisation in general.²⁶ Whether a woman is moving to escape past IPV, has been moved by an offending partner or is simply a woman at risk of engaging in an abusive relationship, this social isolation perhaps plays out in a uniquely detrimental way in terms of IPV. Further research should be designed to examine details surrounding the circumstances of a woman's residential change, and capture details such as the person she moves from and with. In addition, it is important to better understand the socioeconomic effect of residential change as a means of downward, upward or parallel mobility.

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Competing interests: None.

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