

Securing the premises

How effective are different home security devices, on their own and in combination with others? **Andromachi Tseloni** and **Rebecca Thompson** analyse crime survey data in search of answers

Waking in the middle of the night to the sound of a burglary in progress is a terrifying prospect for most people, as is returning home to find a ransacked house. To ward off such threats, people in the UK spend an estimated £100 million each year on home security measures such as window and door locks and burglar alarms, according to consumer research firm Mintel.

Household security comes in a variety of forms, and some devices are more effective in preventing burglaries than others. What is the relative likelihood of being burgled if the home owner has fitted, for example, lights on a timer or sensor and security chains instead of door and window locks?

Looking at the protection conferred by a particular security device or set of devices as if they operated

in a void, without caring for whether (and which) other security exists, is not very helpful. It is therefore important to identify and compare the protective effect of each available security device in order to take informed security investment decisions.

To weigh the relative merits of home security devices, and combinations thereof, we used data from the Crime Survey for England and Wales (CSEW), covering the years 2008/09 to 2011/12. The CSEW measures the extent of crime in England and Wales by asking people whether they have experienced any crime in the past year. In the most recent wave, roughly 35 000 households were interviewed.

The survey asks respondents about their experiences of domestic burglary, whether any items were stolen and whether any damage was caused as a result. (The survey also covers attempted burglary, but we have excluded that category of crime from this analysis.)

A subsample of survey takers are also asked to complete the Crime Prevention Module, which asks about the presence of security devices in the home. The list of devices includes burglar alarms, door deadlocks or double locks, window locks, dummy alarm boxes, security chains, window bars or grilles, external lights on a timer or sensor, indoor lights on a timer or sensor, and closed-circuit television (CCTV) cameras.

With this data to hand, we set about assessing the protective effect of each device on its own and in combination with other devices (limited, that is, to the most frequently seen combinations of devices – exploring all possible combinations of nine items would have been unmanageable).

Table 1 shows how our assessments were made. The CSEW data we used contained security information on 37 416 households – which served as our “general population”. Of those households, 2245 had been burgled. Among the general population, 1835 homes had no security (a proportion of 0.049), while among the burgled households, 821 (0.366) had no security. Dividing the proportion of burgled homes without security by that of the general population



Table 1. Security protection factors (SPFs) for selected security devices and combinations against burglary with entry

Security devices	Burgled Households with security information	Households with security information	Proportion of households with security information	Proportion of burglary victims with security information	Odds ratio	SPFs
Total	37416	2245	-	-	-	-
No security	1835	821	1835/37416 = 0.049	821/2245 = 0.366	0.366/0.049 = 7.46	-
Single presence of selected security devices in the house/flat						
Window locks	1765	120	0.047	0.053	1.13	7.46/1.13 = 6.58
Door deadlocks or double locks	905	145	0.024	0.065	2.67	2.79
External lights	242	36	0.006	0.016	2.48	3.01
Burglar alarm	212	106	0.006	0.047	8.33	0.89
Selected combinations of security devices present in the house/flat						
Window and door locks	5381	192	0.144	0.086	0.59	12.54
External lights, window and door locks	3307	43	0.088	0.019	0.22	34.41
Security chains, window and door locks	2743	38	0.073	0.017	0.23	32.30
External and internal lights, window and door locks	1537	14	0.041	0.006	0.15	49.12
CCTV, security chains, window and door locks	116	1	0.003	0.00045	0.14	51.90

(0.366/0.049) gave us an odds ratio (OR) for burglary victimisation without security of 7.46.

How much protection?

This OR was a crucial component in the next stage of our analysis – working out the security protection factor (SPF) for each device and device combinations. Our SPFs refer to the odds ratio of burglary risk in those households without security with respect to burglary risk within households with any set of security devices.¹

The SPF is expressed as:

$$SPF = \frac{\frac{\text{Burglary Victims no security}}{\text{Burglary Victims}} / \frac{\text{Households no security}}{\text{Total Households}}}{\frac{\text{Burglary Victims with security}}{\text{Burglary Victims}} / \frac{\text{Households with security}}{\text{Total Households}}}$$

$$= \frac{\frac{\text{Burglary Victims no security}}{\text{Households no security}} / \frac{\text{Burglary Victims}}{\text{Total Households}}}{\frac{\text{Burglary Victims with security}}{\text{Households with security}} / \frac{\text{Burglary Victims}}{\text{Total Households}}}$$

After rearranging the terms and cancelling out the overall burglary risk (burglary victims over total households), the numerator and denominator of the SPF are, respectively, the conditional burglary risks without and with security.

Take window locks as an example. Table 1 shows that window locks as a single security

feature were present in 1765 households, 120 of which had been burgled. The prevalence of homes with window locks as their only security feature is essentially the same in the general population and among burglary victims: 0.047 and 0.053, respectively. The OR of burglary

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victimisation with window locks is therefore 1.13, and – as one would expect – this is much lower than the OR for households without security (7.46, as previously mentioned).

The SPF for window locks is calculated by dividing the OR of burglary victimisation of households without security by the OR of

burglary victimisation with window locks – that is, 7.46/1.13 = 6.58. In other words, if your house or flat has window locks but no other security then it is roughly 6 times more protected from burglary than homes without security. However a one-tail hypothesis test indicated that we cannot reject the null hypothesis that window locks are equally prevalent in the general population as they are among victims. Therefore, we cannot conclude that window locks alone prevent burglary. Other factors may be at work.

Standalone measures

Table 1 presents similar calculations for other individual devices, listed in descending order of frequency in the CSEW sample. After window locks, the second most common security feature is door double locks or deadlocks, which are currently present in about 78% of homes (regardless of other measures). If your household is one of the roughly one in 42 with only this security measure then it is 2.8 times more protected than homes with no security.

External lights on a sensor or timer switch (which turn on with movement or remain on during the night) are a relatively

inexpensive means to avoid being targeted by burglars. Houses/flats with external lights alone are 3 times more protected from burglary than those with no security. If you do not possess any of the above, do not despair: other devices, such as security chains or CCTV cameras, used in isolation are also effective but to a lesser extent.

Of all the SPF scores, the most curious is that of burglar alarms. Alarms fitted in a domestic property may reduce home insurance premiums. However, homes which have burglar alarms as their sole security feature would seem to be at marginally greater risk of burglary than those without security.

Worried readers should note two points. Firstly, our counter-intuitive finding refers to the “average” burglar alarm in England and Wales: it does not examine technical specification, cost, installation year, whether the alarm is linked to a police station, or any other characteristic that may determine an alarm’s effectiveness.² Secondly, there are very few homes that have only a burglar alarm – one in every 167 households, to be exact – and perhaps an alarm in this context acts as a beacon, alerting burglars to the prospect of valuable items, especially in poorer areas where other homes might not have such devices.

Stacked effects

Interviews with offenders suggest that, in isolation, many common household security

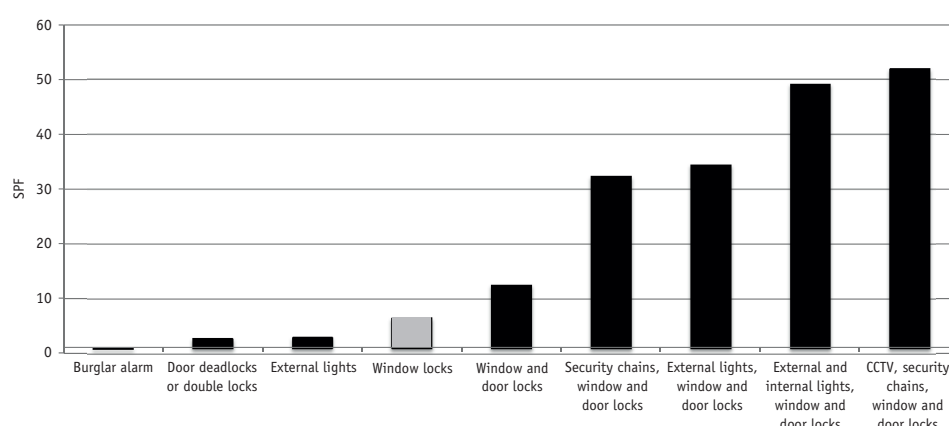


Figure 1. Security protection factors (SPFs) of selected home security features based on the 2008/09–2011/12 CSEW. Note: SPF values for all individual and combined security devices presented here are based on statistically significant ($p \leq 0.05$) one-tail difference of probabilities hypotheses tests except for the SPF value for window locks (shaded grey)

measures have a limited deterrent effect.³ Indeed, houses/flats with more security features have lower burglary rates, as can be seen in the CSEW data. And while SPF results may vary for individual devices, combinations of stronger and weaker devices can achieve economies of scale, as can be seen clearly in Figure 1.

For example, the SPF for door double locks or deadlocks, if they are the only security measure in the home, is 2.79, while that of window locks is 6.58. However, the SPF of the two measures combined is 12.54, which is 3.17 points greater than the sum of its parts.

In addition to window and door locks, one in every 12 households also has external lights, and one in every 14 has security

chains. These additions to the window and door lock combination raise SPF scores to 34 and 32, respectively.

In general, homes with more devices are better protected than those with fewer security measures, but only up to a point – after which quality, expressed here as the collective preventive power of security combinations, is more important than quantity.

Two combinations, consisting of four devices each, stood out in our analysis. The first includes CCTV cameras, window and door locks, and security chains. Together, these security measures offer 52 times more protection against burglary when compared to no security. This is a much higher SPF than would be expected from the sum of the SPFs of each individual device (13). However, this combination of devices is rare, being present in only one in every 323 homes – hardly surprising if one considers that CCTV cameras are unaffordable for most, and that security chains present a fire hazard. Therefore, this combination seems impractical for policy recommendations.

A much better bet for home owners is the combination of devices we have termed WIDE: window locks, indoor lights on a timer, door double locks or deadlocks, and external lights on a timer or sensor. This setup affords 49 times more protection than no security, with an SPF score 33 points greater than the sum of the individual components.

This combination is already present in roughly one in 24 homes, and with one in every 7 households already having window and door locks, the negligible additional cost of acquiring the necessary lights makes

Some caveats

From a methodological perspective our analysis is far from perfect. Firstly, “no security” means “no security from the list of devices examined”. For instance, households participating in the survey may have a dog, or their houses/flats may have electric fences or a concierge – but this is still recorded as no security.

Secondly, the home security, if any, of the most crime-suffering cohort of the population may be unknown. CSEW respondents who report crime experiences in the year prior to their interview are asked a detailed set of questions about the incidents via the survey’s Victimisation Module (VM). However, owing to length of interview concerns and survey funding considerations, respondents are only asked to complete a maximum of six VMs – three long versions and three short versions. The more serious the incident, the more likely it is to be examined by the long version of the VM, but this is the only version that includes questions about the presence of security devices in the home at the time of a burglary. Therefore, if burglary is of lesser seriousness when compared to other crimes experienced by a victim in a given year, details of their home security set-up might not be known.

Finally, the reduced sample of the CSEW Crime Prevention Module does not permit us to examine all possible security configurations.

it an attractive investment for further securing homes.

Wider benefits

Our findings would seem to endorse insurance policies that reward door and window locks in domestic properties, while questioning the wisdom of offering discounts for the presence of a burglar alarm in an unqualified manner.

However, different households face different levels of burglary risk and lack effective security to a varying degree. We therefore sought to refine the previous analysis, which provided a national overview, by calculating conditional SPFs across socio-economic population groups and area types. To this end, we used bivariate or joint hierarchical logit modelling of the association between effective security and burglary victimisation that accounts for group composition, with household and area characteristics obtained from the CSEW and Census, respectively.

The results were telling: security is not the blanket solution to prevent burglary, and its effectiveness should be contextualised. Security plays an important but *not unqualified* role in burglary prevention: risk is not commensurate to absence of effective security.

Figure 2 shows burglary victimisation and the presence of effective security (the WIDE combination) among social and private renters relative to home owners (the benchmark). Save for tenure, the estimates

refer to households that are identical in all other individual and area characteristics (that were included in the models).

The chart shows that private and social renters lack effective security to a similar extent (73% lower than owner-occupiers) but the effect on the latter group is graver. A council housing tenant faces nearly double the odds of burglary victimisation compared to home owners, while someone renting privately has burglary victimisation odds 37% higher than the benchmark. The combined (blue and red) height of each bar in Figure 2 in effect reflects the (conditional) burglary protection of WIDE for social and private renters, respectively.

Similar comparisons can be undertaken across population groups with respect to an array of relevant (statistically significant) socio-economic characteristics, such as ethnic group, household composition and others. With respect to area characteristics, one may reasonably expect that households living in affluent areas may be at higher risk but also more protected than residents of deprived neighbourhoods. In reality, the opposite occurs: the more deprived an area is the higher the burglary risk faced by the households living in it, and the lower the presence of effective security.

Our analysis suggests that ever more security does not neatly translate to burglary reductions. The efficiency of security – installing the best-performing devices and combinations of devices – is paramount. Still, some population groups would benefit more from effective securitisation than

others. Our findings can guide future crime prevention policies to tackle burglary via security investments that parallel need and expected gains.

Acknowledgements

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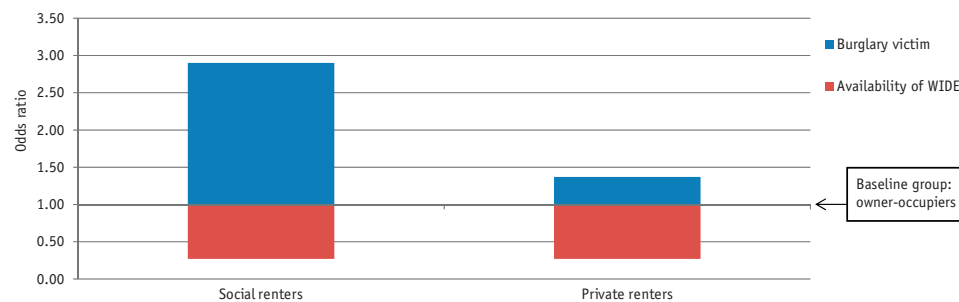


Figure 2. Odds ratios of burglary victimisation and presence of external and internal lights, window and door locks (WIDE) of social and private renters with respect to owner-occupiers, based on the 2008/09–2011/12 CSEW. Notes: 1. The baseline category of tenure is owner-occupiers with odds ratio value of 1 for both burglary victimisation and presence of WIDE. Social (first bar) and private (second bar) renters’ odds ratios for each outcome are compared to that of owner-occupiers. The blue part of each bar denotes burglary victimisation. The red part denotes the presence of WIDE. For example, social renters are nearly twice ($2.9 - 1 = 1.9$) as likely to be victims of burglary and 73% ($100 \times (1 - 0.27)$) less likely to have WIDE compared to owner-occupiers of otherwise identical characteristics. 2. The estimated parameters of the joint (bivariate) hierarchical logit model of burglary victimisation and presence of WIDE for tenure have $p \leq 0.01$ except for the private renters’ coefficient of burglary victimisation which has $0.05 < p \leq 0.10$.

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