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MOBILISING CIVIL SOCIETY AGAINST RESIDENTIAL BURGLARY: THE EVIDENCE

A Report to **TrygFonden**

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ABSTRACT: Danish householders can reduce their risks of being burglarized by installing and *using* multiple but simple *barrier* devices, such as window locks, double (deadbolt) door locks, and a security chain inside any external door, as well as by making homes appear to be occupied, such as setting lights on a timer (both inside and outside). There is no clear evidence, however, that burglar *alarms* prevent burglary, and some evidence that alarms may even *increase* the risk of burglary. While most burglary in Denmark occurs in isolated cases, the greatest risk of burglary is in a home that has just been burgled recently; burglars often return to the scene within 14 days. There is also a higher risk to any home nearby another home that has just been burgled. Adding and using multiple security devices is especially important in the two weeks after each burglary.

Danish Neighbourhoods can reduce their risks of burglary by organizing and participating in a "neighbourhood watch," in which neighbours meet periodically to get to know each other by face and discuss the value of "target hardening" their security devices. They can also join together in a "cocoon watch" around any home that has just been burglarized, protecting all the homes in the immediate vicinity by looking out for non-residents in the area, locking doors and windows, and reviewing or upgrading security.

Local Governments may reduce burglary risks by taking civil actions against disorderly activities in or near any residential areas, which is a risk factor for burglary. They may also be able to increase enforcement of laws or codes requiring door and window locks in rental properties, and promote the use of multiple security devices in high burglary areas. They are unlikely to get any benefits for burglary reduction from increased street lighting. And while one US study shows lower burglary rates in gated communities of different income levels, that strategy backfired in South Africa and may be incompatible with Danish values.

National Government can reduce burglary risks by legislation promoting, requiring or funding simple residential security devices as a minimum housing standard, including window locks and timers for external lighting. They could also review the possible banning of the use of cash in purchasing often-stolen goods, such as smart phones, televisions or scrap metal.

Everyone can, in principle, discourage burglaries by refusing to purchase goods that may be stolen, although little research is available so far to guide the use of this principle.

The research method for this report was to search for and classify as many Englishlanguage studies that could be found by a series of systematic searches, in which team members each identified potentially eligible studies in their assigned area, then rejected studies that did not meet the criteria required for inclusion in the report. The criteria were that studies had to be only about *burglaries of homes*, not mixed with other crimes; to use *reliable measures* of both burglaries and strategies to prevent them; to use two or more *comparison groups* for studies of "what works," and one or more *statistically significant correlations* for studies of "what *may* work." The category of "open questions" includes prevention tactics that have contradictory evidence, no evidence, or even strong negative evidence, since we cannot prove what does *not* work in Denmark until tests are done here.

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SUMMARY

Danish householders can reduce their risks of being burglarized by installing and *using* multiple but simple *barrier* devices, such as window locks, double (deadbolt) door locks, and a security chain inside any external door, as well as by making homes appear to be occupied, such as setting lights on a timer (both inside and outside). There is no clear evidence, however, that burglar *alarms* prevent burglary, and some evidence that alarms may even *increase* the risk of burglary. While most burglary in Denmark occurs in isolated cases, the greatest risk of burglary is in a home that has just been burgled recently; burglars often return to the scene within 14 days. There is also a higher risk to any home nearby another home that has just been burgled. Adding and using multiple security devices is especially important in the two weeks after each burglary.

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Tables and Figures

The following tables summarize the key conclusions about what householders, neighbourhoods, local governments and national governments can do to reduce burglary, as well as the major risk factors for burglary. Figures 1-3 illustrate key points, and Table 2 provides references for the conclusions in Table 1.

	What Works	What May Work	Open Questions
At Home	Improvements in	Keeping a dog in	Property Marking ID
	security using	your home when you	
	multiple methods,	go out	
	especially		
	window locks		
	inside and outside		
	lights on a timer,		
	double ("deadbolt")		
	door locks,		
	chain inside door,		
	especially just after a		
	burglary in your		
	home or a neighbor's		
	Keeping doors and	Leaving lights turned	Local or silent
	windows locked	on at when away	burglar alarms
	"Target-Hardening:"	Adding fences or	
Making windows,	Making windows,	plants to reduce	
	locks and doors	visibility of back	
	stronger	gardens (may reduce	
		night-time burglary)	
		Someone often	
		staying home	
<u>With Your</u>	Neighbourhood	A "cocoon" watch	
Neighbours	Watch, usually with	around recently	
	target-hardening	burgled homes	
		CCTV in an	
		apartment complex	
	Closing off public	Notifying neighbours	
	access to back doors	of each new burglary	
	by "alley-gating"		
With Local		Civil enforcement of	Increased street
Governments		housing codes in	lighting in higher-
		disorderly areas	risk areas
	Targeting Repeat		Fostering Gated
	Burglary Areas for		Communities
	Target-Hardening		
	Enforcing standards	Encouraging attached	
	for locks & doors	housing units	
		1	

TABLE 1	(Summary):	How To	Reduce	Your	Risk o	f Burglary
	(Summary).	110.00 1.0	ncuuce	IUUI	I LISIL U	i Dui giai y

<u>With National</u> <u>Government</u>	Setting enforceable standards for locks & doors	Encouraging attached or high-rise housing	
<u>In What You Buy</u>		Support police recovering stolen property from drug dealers who exchange drugs for it	Police efforts to discourage sales of stolen goods

Which Homes May Be Most At Risk of Burglary?

Homes in which

- A burglary has just occurred
- A burglary has just occurred nearby
- There is easy access to windows or doors on the ground floor
- The home is located on a street corner
- The house is detached from other houses
- Doors and windows are often left unlocked
- No one is home for many hours a day on a regular basis
- There is a heavy concentration of disrupted families in the community
- There is substantial social disorder in the immediate vicinity

Knowing these risks is only a beginning. To learn how to control them requires field experiments, but few such experiments have been done anywhere, let alone in Denmark. To understand how to reduce burglary, everyone needs to know *how* we know what works.

How Do We Know What Works?

Every method of burglary prevention on the list of "what works" has been tested with a similar comparison group in at least one, but usually two or more, studies, and we found no substantial evidence to contradict the conclusion that the method reduced burglary. These studies are usually strong enough to meet the threshold of "Level 3" on the Maryland Scientific Methods Scale (SMS), although in some cases we rely on good Level 2 tests as the second study. But what do these levels mean?

We used the Maryland **Scientific Methods Scale** (SMS) to rank the strength of evidence supporting every claim of cause and effect from 1 (lowest) to 5 (highest). The higher the score, the more confident we can be that a prevention method caused a reduction (or increase) in burglary, rather than some other chance or coincidental factor that biased the study towards one conclusion. The best defence against such "bias" is an untouched but similar comparison sample, in which burglary is measured in the same way, but the prevention method is not used. At Level 1, this is done by simple correlations at the same point in time, with many other possible explanations for each correlation. At Level 2, studies benefit from the element of temporal sequence, comparing burglary rates in the same area from before to after a new burglary prevention method is introduced. At Level 3, studies benefit from both sequence and a fair comparison, such as when one area using a prevention method is compared to one other area that does not. At Level 4, there are multiple areas or units matched on relevant factors, with half using the method and half not. At Level 5, however, a large sample of units (100 or more) is randomly assigned either to use the prevention method or not (Sherman, 1997).

How Do We Know What May Work?

Every method of burglary prevention on the "What May Work" list has been shown to have some correlation with lower burglary risk in at least one study, and there is no evidence known to contradict the observations. These correlations may offer evidence as low as Levels 1 or 2 on the Maryland scale, with no controlled comparison to similar units to see if burglary would have been lower even without the method. That is why we can only say it *may* work, rather than that it *does* work to reduce burglary risk. It is also how we say what homes may be at greater risk.

How Much Protection Does Each Security Device Give A Home?

A good example of what *may* work is a recent level 1 study of security devices in 37,416 households in England & Wales (Tseloni et al, 2014). This study calculated a "security protection factor" (SPF) for the most commonly used prevention methods, which is a simple correlation. It showed that homes with no security were seven times more likely to be burglarized than homes with any security. But it also found that multiple security devices in some combinations produce far higher SPFs than others. One combination that showed 20 times greater security from burglary than having no security devices (p.1) was this list:

window and door double-locks plus external lights on a timer or a security chain.

Taking individual security devices one at a time, the security protection factor was also higher for some devices than others, as the quoted Figure 1 from the study (p.8) shows below--with the surprising finding that homes with burglar alarms were more likely to be burglarized.

Figure 1: Security Protection Factor for Individual Security Devices, England & Wales (Tseloni et al 2014: 8)



How Do We Define an "Open Question?"

Every method of burglary prevention on the "Open Question" list is one that *either* has contradictory evidence from two or more tests of the method, *or* has simply not been studied in a valid test. Contradictions mean, for example, that in two studies, burglary went down when burglar alarms were present, but in two others burglaries were higher with alarms. In other cases, contradictions may simply mean that the method succeeded in one test but made no difference in another. The complete lack of any valid study means there is no study we can find that provides good measurement of how the prevention method correlates to household burglary rates.

How Valid Are These Conclusions in Denmark, Where Few Studies Have Been Done?

We cannot be sure. There is a great need to repeat many of these tests in Denmark, even for methods that we can't say work. Burglar alarms, for example, may be a prevention method on which Danish people spend large amounts of money, but without any assurance of a return on that investment in a lower risk of burglary. Other burglary studies in the UK and US may reflect a substantially different physical geography. "Alley-gating" may work well where houses have back alleys running between them, but not where there are no alleys, as in much of Denmark. Coin-operated gas heaters were once a cause of burglary in the UK, but are not in modern Denmark. Yet the difference between high rise apartments and low-rise housing, as documented in Toronto, seems likely to apply to Denmark as well, given the sheer physical risk of climbing up to a fourth-floor window to break and enter a home in any country.

Why Does This Report Omit Police Strategies for Preventing Burglary?

This report focuses on what residents can do immediately in their homes and communities to reduce the winter risk of burglary. A further report will be produced in spring of 2017 to review what is known about effective police methods in fighting burglary.

Where Can More Information on Burglary Research Be Found?

The next table provides references to the studies that support each item on each list, with the number 1 to 5 indicating the Scientific Methods Score of each study.

	What Works What May Work		Open Questions		
At Home					
SR = Systematic Review	Improvements in home security using multiple methods (Allat, 1984:3; Tilley & Webb 1994, SMS: 3; Forrester et al 1988, SMS: 3) especially window locks, inside and outside lights on a timer, double (deadbolt) door locks, chain inside door (Tseloni et al 2014 SMS: 1), <i>especially</i> <i>just after a burglary</i> <i>in your home or a</i> <i>neighbor's</i> (Grove,2011 SR; Grove et al 2012 SR*; Johnson & Davies 2014 SMS: 1)	A dog at home when you go out (Montoya et al, 2016; SMS:1)	Property Marking ID Work: Laycock, 1985, 1991; SMS: 4 Don't: Gabor, 1981 SMS: 2		
	Keeping doors and windows locked (Allat, 1984 SMS: 3; Tilley et al 2015 SMS: 2)	Lights on at night (Repetto, 1974) SMS: 1	Local or silent burglar alarms Work : (Lee 2007, SMS:2; Tilley et al 2015 SMS:1) Don't: (Tseloni et al 2014 SMS: 1; Tilley et al 2015 SMS: 2).		
	Making locks and doors stronger (2 studies by Tilley and Webb 1994. SMS: 3)	Adding fences or plants to reduce visibility of back gardens may reduce night-time burglary (Montoya et al 2014 SMS: 1)			
		someone often staying home (Waller & Okihiro 1978			

TABLE 2 (Summary): Research On How To Reduce Your Risk of Burglary

		SMS: 1) (Repetto 1974; SMS: 1)	
With Your	Neighbourhood	A "cocoon" watch	
Neighbours	Watch usually with	around recently	
i (eignooui s	target-hardening	burgled homes	
*SR = Systematic Review	(Bennett et al 2006	(Rowley 2012 SMS)	
	2008 SR^{*} Pate et al	2. Fielding & Jones	
	$1087 \text{ SMS} \cdot 5)$	2, 1 letting & joints 2012 SMS \cdot 2)	
	1707 51415. 5)	CCTV in an	
		A partmant complay	
		(Chatterten and	
		Frenz, 1994; $SNIS=$	
	<u>C1 : CC 11:</u>	$\frac{2}{1}$	
	Closing off public	Notifying neighbours	
	access to back doors	of each new burglary	
	by "alley-gating"	(Rowley 2013 SMS:	
	(Bowers et al, 2004;	2)	
	Haywood et al 2009		
	SMS: 2)		
With Legal	Summerting higher	En aguna ain a attachad	
With Local	Supporting night	Encouraging attached	
Governments	standards for focks &	nousing units	
	$(A_{11}^{-4}, 1004, CMG, 2)$	(Montoya et al 2014	
	(Allat 1984 SMS: 3)	$\frac{SMS(1)}{C(1)}$	
		Civil enforcement of	Fostering Gated
		nousing codes in	Communities
		disorderly areas	works in US:
		(Mazerolie & Roeni	Addington α
		1999, SIVIS. 3,	
		Seminary and Crosses	1) Deservitin C. Africas
		Sampson and Groves	Doesn't in S. Airica:
		1989; SMS: 1)	Breetzke & Conn
			2013 SIMIS: 1;
			Breetzke et al 2013
With National	Sotting standards for	Encouraging attached	SIVIS. 1)
Covernment	looks & doors that	bousing units	
Government	oon he enforced	(Montova at al 2014	
	$(\Lambda 11_{at} 108/1 \text{ SMS} \cdot 3)$	(Montoya et al 2014 SMS· 1)	
	(7 mar 1704 51415. 5)	Encouraging high-	
		rise units (Waller and	
		Okihiro 1978 SMS	
		1)	
In what you huy		Support police	Police efforts to
jou buy		recovering stolen	discourage sales of
		property from drug	stolen goods
		dealers who	(Sutton et al 2001
		exchange drugs for it	SMS· 3)
		(Stevenson and Forsythe	51410. 57
		1998: SMS: 1)	

Evidence on Which Homes Are Most At Risk of Burglary

This section summarizes the source of Level 1 correlational evidence on which homes are most at risk of burglary, taken from the list of bullet points at the outset of the summary. A few Figures are added to illustrate the patterns of risk in time or space.

• A burglary has just occurred (Johnson, et al, 2007) Figure 2: Repeat Burglary in Los Angeles



(Source: Los Angeles Police Department, slide 11 at http://www.slideshare.net/socialmediadna/predictive)

• A burglary has just occurred nearby

Figure 3: Repeat and Near-Repeat Burglaries in Merseyside UK



(Source: Johnson and Davies, 2014)

- A burglary has just occurred in a nearby home (Johnson et al, 2007)
- There is easy access to windows or doors on the ground floor (Waller and Okihiro, 1978, SMS: 1)
- The home is located on a street corner (Montoya et al 2014)
- Doors and windows are often left unlocked (Waller and Okihiro 1978)
- No one is home for many hours a day on a regular basis (Waller and Okihiro, 1978; Repetto, 1974)
- The house is detached from other houses (Montoya, et al 2016)
- There is a heavy concentration of disrupted families in the community (Sampson and Groves 1989: 791)
- There is substantial social disorder in the immediate vicinity (Sampson and Groves, 1989: 791).

1.INTRODUCTION:

EVIDENCE-BASED DECISION-MAKING ON CRIME PREVENTION

What can Danish householders do to reduce their chances of being burglarized? There are many ways to answer that question. One way is to undertake a survey of public opinion. Another would be to take an opinion survey of burglars, or of their victims. One could interview experienced burglary detectives, who have investigated thousands of burglaries. Or you could survey a group of experts, called a "Delphi" study, which would focus on criminologists and others who study burglary.

The result of any of these methods would be likely to produce a list of theories about "what works" to reduce the risk of household burglaries in Denmark. That list might be very useful in reviewing or developing methods of burglary prevention. "Nothing is as practical as a good theory," as Kurt Lewin, the pioneering psychologist of innovation, taught us. Yet he would be the first to agree that nothing is as uncertain (and impractical) as a theory without evidence.

So which comes first: the theory or the evidence?

1.1.Theories and Evidence

The long history of social progress suggests that evidence usually precedes major advances in theory. Darwin observed genetic differences in the Galapagos before he proposed his theory of natural selection. James Lind discovered that lime juice *did* cure scurvy a century before Vitamin C explained *why* it did. Yet for centuries, people have tried to invented methods of preventing burglary based on theory alone, rather than on good evidence. Perhaps that is why we still know so little about what works to prevent burglary.

In most cases, people just "try" a new method to prevent burglary, without adequately *testing* how well the method works against a fair comparison method. The long history of medicine shows much the same mistake until the mid-20th Century, when science was injected into medical training and helped insure adequate testing of more medical innovations. Since the late 20th Century, this new empirical approach has been called "evidence-based medicine."

Inspired by that progress in medicine, Sherman (1998) proposed to apply the same standards to policing and crime prevention under the banner of "evidence-based policing." His proposal came one year after the publication of the University of Maryland report to the U.S. Congress on *Preventing Crime: What Works, What Doesn't, What's Promising* (Sherman et al, 1997). That report launched the Maryland "scientific methods scale" (SMS) that has since been used by governments around the world to distinguish strong evidence from weak, and effective anti-crime programs from money-wasters--or (even worse) crime-causers.

Two decades later, a global social movement has emerged among crime prevention professionals to emphasize empirical facts about what works to reduce crime. Societies of Evidence-Based Policing with thousands of members can be found in five countries on three continents. As it grows, the movement's emphasis on "what works" is broadening to embrace all three kinds of evidence that matters for policy-making, not just the impact testing question of "what works."

1.2 Triple-T Decision-Making: Targeting, Testing and Tracking

The question of how Danish householders can prevent burglary requires three kinds of evidence, called the "Three Ts." The first kind of evidence is what police call "*targeting*," reflecting what doctors call both "epidemiology" and "diagnosis." What works for preventing lung cancer (primary prevention), for example, is different from what works for preventing the spread of lung cancer once it is detected. Similarly, the evidence on burglary prevention allows us to distinguish, to some extent, between primary prevention and the "secondary" prevention of repeat burglaries in the same households, neighbourhoods or municipalities.

The more precisely a prevention method for burglary (or any crime) can be targeted, the more accurately that method can then be *tested*. A test is defined as a comparison between two groups, one of which receives one intervention while the other receives no (or a different) intervention.

1.3 The Maryland Scale of Scientific Methods

The Maryland Scale of Scientific Methods ranks each study 1 (weakest) to 5 (strongest) on overall internal validity. The ratings that could be used with greatest consistency is an overall score based primarily on three factors:

• **Control of other variables** in the analysis that might have been the true causes of any observed connection between a program and crime.

• **Measurement error** from such things as subjects lost over time (attrition) or low interview response rates.

• **Statistical power** to detect program effects (including sample size, base rate of crime, and other factors affecting the likelihood of the study detecting a true difference not due to chance)

Research design. Exhibit 1 below summarizes the key elements in the scoring of evaluations. The scientific issues for inferring cause and effect vary somewhat by setting, and the specific criteria for applying the scientific methods scale vary accordingly. Issues such as "sample attrition," or subjects dropping out of treatment or measurement, for example, do not apply to most evaluations of commercial security practices. But across all settings, the scientific methods scale does include these core criteria, which define the five levels of the Maryland Scale of Scientific Methods:

Level 1. Correlation between a crime prevention program and a measure of crime or crime risk factors at a single point in time.

Level 2. Temporal sequence between the program and the crime or risk outcome clearly observed, or the presence of a comparison group without demonstrated comparability to the treatment group.

Level 3. A comparison between two or more comparable units of analysis, one with and one without the program.

Level 4. Comparison between multiple units with and without the program, controlling for other factors, or using comparison units that evidence only minor differences.

Level 5. Random assignment and analysis of comparable units to program and comparison groups.

Threats to internal validity. The scientific importance of these elements is illustrated in the bottom half of exhibit 1, showing the extent to which each level on the scientific methods scale controls for various threats to internal validity. The main threats to validity indicated in the four columns are these:

• Causal direction, the question of whether the crime caused the program to be present or the program caused the observed level of crime.

• **History**, the passage of time or other factors external to the program that may have caused a change in crime rather than the prevention program itself.

• **Chance factors,** or events within the program group (such as imprisoning a few active offenders), that could have been the true cause of any measured change in crime.

• Selection bias, or factors characterizing the group receiving a program, that independently affect the observed level of crime.

As exhibit 1 shows, each higher level of the Maryland scale from weakest to strongest removes more of these threats to validity, with the highest level on the scale generally controlling all four of them and the bottom level suffering all four. The progressive removal of such threats to demonstrating the causal link between the program effect and crime is the logical basis for the increasing confidence scientists put into studies with fewer threats to internal validity (Cook and Campbell, 1979).

Exhibit 1: The Maryland Scale of Scientific Methods

A. Research Designs

	Before-After	Control	Multiple Units	Randomization
Methods Score				
Level 1	0	0	Х	0
Level 2	Х	0	0*	0
Level 3	Х	Х	0	0
Level 4	Х	Х	Х	0
Level 5	Х	Х	Х	Х

B. Threats to Internal Validity

	Causal Direction	History	Chance Factors	Selection Bias
Methods Score				
Level 1	Х	Х	Х	Х
Level 2	0	Х	Х	Х
Level 3	0	0	Х	Х
Level 4	0	0	0	Х
Level 5	0	0	0	0

Key: X = present

0 = absent

*Except where a comparison unit is employed without demonstrated comparability.

Testing Methods Separately or in Combination. One difficulty this report faces is that many of the studies of burglary reduction have focused on testing several prevention methods in combination. *The strategy of using multiple methods simultaneously to reduce burglary is well-established, and even has some evidence to support it.* Yet the refinement of the relative success and cost-effectiveness of different combinations remains elusive, since it is rare that two program tests have employed exactly the same combination of methods. At many points in this review, we must note that a prevention method has been part of a successful burglary reduction package. But any test of multiple methods is unable to say whether any one method was a major, or even beneficial, element of the overall program.

1.4 The Scope Of This Report

This report is limited to burglary prevention actions that can originate in civil society. A separate report can be produced on actions that can originate in the police, but that domain is largely beyond the scope of the current report. Even though the report does describe some methods police have tested, they are presented only on the premise that the same methods could likely be delivered by civil society groups, either with or without police cooperation.

The report also excludes burglaries in other settings besides residential households. While many burglaries do occur in such settings, both victims and offenders may be in separate populations from residential burglaries.

2. TARGETING BURGLARY REDUCTION

2.1. Predicting and Preventing Burglaries

Despite claims from some commercial firms selling software to police, the prediction of burglary in time and space is highly prone to error. We cannot yet predict *exactly* where and when burglaries will and will not occur. The rate of burglary per 1,000 households is always too high in any humanitarian sense. Yet in statistical terms, the burglary rate is too low for generating high accuracy of predictions. Since the Minneapolis analysis of Sherman et al (1989), we have known that burglary is one of the crime types that is *least concentrated* in time and space. This dispersion across any jurisdiction may mask higher rates in some areas than others. Yet the use of police patrol in low-density residential areas is bound to produce relatively small deterrent effects, even in areas with higher burglary rates.

Many argue that prediction is a necessary prerequisite for prevention. On that basis, they target the patterns of repeat burglary for prevention efforts. Yet the logic of that strategy depends upon a fact that is rarely addressed in repeat burglary prevention: the percentage of the entire burglary problem that targeting repeats can engage. The fact seems to be, in Denmark as elsewhere, that too few burglaries are "repeat" or "near-repeat" for a targeting plan to succeed in reducing overall burglary by a substantial amount.

2.2. Repeat Victimisation

At one time, UK researchers had great hopes that targeting repeat victimisation would provide a way to reduce the burglary rate substantially. The evidence now suggests that such hopes were not realized. The studies of repeat victimization we found all show that repeats comprise a *minority* of all burglaries. Figure 1 shows how low repeat victimisation rates are within one year in most studies, with only one study showing more than 1 in 5 burglaries followed by a second burglary. Figure 2 shows that when the sum of repeat burglaries is divided by the sum of all burglaries, the role of repeats in the total problem of burglary appears to be quite small.



Figure 1: Percentage of burgled houses that were re-burglarised within 12 months from studies that gave 12 month rolling home victimisation rates using police data



Figure 2: Percentage of all burglaries that are repeats from studies that gave exact 12-month repeat victimisation for every burglary, using police data.

The Danish government repeat burglary victim literature is substantial, with the studies for the Ministry of Justice (Sorensen, 2004; Sorensen, 2011) concluding the following (with table 4.3 reprinted below):

The annual burglary rate in Denmark in 2002 was 1.4%. Once victimised, the percentage revictimisation rate in following 12 months was 7.9% (5.6 times greater than the base rate, but still a minority of all burglaries). Burglary re-victimisation further concentrates with 10.5% of the twice victimised households suffering a third, and 20.2% of those suffering a 4th. The repeat victims by house type were as follows:

	Total	Total	Number of			Addresses		
TYPE OF PROPERTY	Addresses	Addresses Burglaries Victimizations (%) Burgled 2+ Ti			2+ Times			
			1	2	3+	n	%	
Villas, Apts, and Farms	20,765	22,624	92.1%	7.1%	0.8%	1,647	7.9%	
Villas	15,309	16,722	91.8%	7.4%	0.9%	1,255	8.2%	
Apartments	4,158	4,389	95.0%	4.6%	0.4%	209	5.0%	
Farmhouses	1,346	1,446	93.3%	6.1%	0.6%	90	6.7%	

Table 4.3: Address Concentration in a One-Year Rolling Follow-up, by Property Type

Time course: 19% of all first repeats occurred within one month of the initial offence (30% in the case of apartments). 8.3% in the first week as shown in Sorensen's table below. The expected prevalence of a repeat in the first week after victimisation is 24.5 times the base prevalence (and 12.7 times higher for the second week).





Sorensen's comparative analysis indicates that Denmark has a lower rate of repeat burglary relative to other countries (see Van Kesteren et al., 2001)) and slower reoccurrence (p41). Although this may have changed since the study with the subsequent increase in overall burglary rates, Sorensen (2011) calculated repeat victim rate for villas and farmhouses (though not comparable with the original study percentages above due to not using apartment data) as shown in table below.

Table 3.4. Address concentration: Number of burgled residences and the % burgled 2+ times per year, by year

	2005	2006	2007	2008	2009	2010
Burgled house residences	19,683	20,771	23,589	28,899	31,798	28,816
% burgled 2+ times	3.6%	4.1%	4.1%	4.6%	4.8%	4.4%
Burgled farm residences	1,631	1,699	1,966	2,914	3,436	2,918
% burgled 2+ times	4.3%	3.2%	4.2%	3.9%	4.7%	5.2%

Source: POLSAS

(Sorensen, 2011)

National level statistics miss the granularity of street level or neighbourhood level analyses, and with it the hotspot areas. The Kirkholt burglary prevention project from the UK is a good example of localised hotspots where the domestic burglary rates were more than twice that of what were considered high risk areas from the 1984 British crime survey (Forrester et al., 1990). So while Sorensen (2004) claimed that focusing prevention efforts on repeats rather than random properties would be 5.5 times more effective, locally targeted repeat and near-repeat approaches in high burglary areas will likely show even greater *returns on investment*, if it works and is applied as soon as possible, specifically in the week or two after victimisation when risk is highest. All that is good for those we can help. We must just recall that this will not prevent the majority of all burglaries.

To further demonstrate that the concentration of repeats can be targeted at more micro levels, the city of Perth, Western Australia is used (House, 2016). The city has a domestic burglary repeat rate of 6.7% (1619 of 24127 cases were repeats, over 13 months, 01 January 2014 to 31 January 2015). However, changing the level of analysis from the city to the suburb level, the top two suburbs for repeats both have a 13-month repeat victimisation rate over 35% higher than the overall average at 9.1% and 9.8% respectively. This is still less than the rate on the Kirkholt estate, but there may be areas within these suburbs with equivalently high levels.

A persistent issue in repeat burglaries, however, is the under-reporting of all burglaries to police. As Frank et al (2012: 486) show in their Table 3 reprinted below, the under-reporting of burglary has a compounding effect on estimating *repeat* burglary rates.

Burglary Frequency	Number of Incidents		Percentage of Incidents			
	Events Reported	Estimated Count	% Reported	% Estimated Count	Difference Ratio	
I	17,113	20,910	80.2	52.9	0.7	
2	3,206	7,254	15.0	18.4	1.2	
3	633	2,652	3.0	6.7	2.3	
4	188	1,459	0.9	3.7	4.2	
5+	189	7,222	0.9	18.3	20.6	
TOTAL	21,329	39,498	100.0	100.0		

 Table 3: Comparison of recorded and estimated actual frequency

 distributions of burglary

The above table uses an expected reporting rate of 54% and makes the assumption that all reports are made independently. This is an example of the potential level of under-reporting of repeat burglary victimisation and the importance of encouraging full reporting.

Farrell and Pease (2003) raise the issue that if 70% of burglaries are reported then repeat burglaries (assuming independence) will have a 49% chance of appearing in the statistics. Any strategy that could increase reporting would assist in identifying repeats and allow for better targeting: for example, in many countries it is a requirement to report burglary to police in order for insurance companies to complete a report/pay out and this may be the case in Denmark.

2.3. "Near-Repeat" Victimisation

There is also evidence that a burglary at one location increases the risk of a future burglary at nearby residences, which criminologists call "near-repeats." These near-repeat burglaries will, by definition, occur at a higher rate than repeat burglaries. In Perth 4% of all burglaries were repeats or near-repeats that occurred within 50 meters and 5 days of the initial burglary.

Expanding "near-repeat" measurement to 100 meters increases near-repeat rate to 6.3% (House, 2016).

There is a lot of survey data from national and international crime surveys giving rates of repeat burglary. As Shaw and Pease (2000) note, however, "Combining data from extremely different places to yield an average measure of crime is to remove the most useful fact about crime for those seeking to prevent it, namely its extreme and predictable concentration on certain people and places." We have not systematically included national level survey data in this analysis for this reason (except in the Danish case), but here is an example of the general point:

The below tables show country, year of survey and percentage repeat burglary (left) and a summary table of all countries' repeat rates in 1996 (right). Repeat burglaries at a national comparative level are moderately consistent across nations; in 1989 the mean percentage of burglary victimisations that were repeats was 16.33 (median 16.03, s.d. 8.60, n = 14 countries).

Country	Year	Burglary	Attempted Burglary
West	1992		
West	1996		
Switzerland	1989	9.09	
Switzerland	1992		
Switzerland	1996	18.75	15.38
Belgium	1989	17.86	
Belgium	1992	19.23	27.27
Belgium	1996		-
France	1989	27.27	
France	1992		
France	1996	17.24	-
Finland	1989		-
Finland	1992		
Finland	1996	25.00	12.50
Spain	1989	19.05	

Table 4: 1996 ICVS Repeat Victimization Rates (n = countries)

	n	Mean	Median	S.D	Coeff. Var.
Sexual incidents	11	45.95	47.06	14.14	30.77
Assault & threats	11	41.27	43.00	7.86	19.05
Robbery	4	27.77	26.79	7.38	26.58
Car vandalism	11	25.03	25.93	5.84	23.33
Motorcycle theft	4	24.84	23.16	8.66	34.86
Bicycle theft	11	19.60	20.31	6.53	33.32
Theft from car	11	19.55	21.05	5.90	30.18
Attempted burglary	9	18.64	19.51	6.98	37.45
Burglary	11	17.14	16.67	7.49	43.70
Theft from person	11	16.43	16.67	4.84	29.46
Theft of car	7	13.25	15.00	6.11	46.11

(Farrell and Bouloukos, 2001)

(Farrell and Bouloukos, 2001)

2.4. Lifestyle and Demographics

There is a substantial literature on the effect of individual lifestyles and demographics on risks of victimisation (e.g., Hindelang, et al, 1978; Reppetto, 1974; Waller and Okihiro, 1978). This literature is complex at the level of households, which may be more at risk with fewer members (leaving the home unoccupied more of the time) and with more members, especially unrelated adults (such as university students), who may leave the home unlocked more often than households with fewer members. This literature may offer far greater

explanatory and predictive power than other areas of research, but democracies understandably tread lightly on issues of personal choice. Age-related risks of burglary victimisation, for example, may lower actuarial risks of burglary, but they do not suggest how to drive down a national burglary rate. While the burglary rate may well be dropping a trend towards proportionately more homes occupied by people over 65 who spend most evenings at home, it is surely not appropriate to recommend this as a policy!

Hence we merely note that this research does exist, but we have largely ignored it in our analysis of *targeting* burglaries for prevention. There are indirect implications, however, for demographics in any geographic targeting. Thus a major question for Denmark, and a fair one, is *where* and *when* burglaries are disproportionately concentrated, so that prevention efforts can be targeted more efficiently. It is unnecessary to use demographics or life-style for that purpose. The simple correlate of those factors is usually place and time. While we were unable to gain any time-space data on burglary distributions in Denmark, a national analysis of the problem could test—and perhaps challenge—the previous conclusion that within one city (Minneapolis) burglaries were not highly concentrated in space. It may well be that 50% of all burglaries in Denmark occur on just 1% of its land mass. Whether it does or not can only be established by a national data analysis, which should be a high priority for burglary prevention (see section 8).

The rest of this report turns to the *testing* of burglary prevention measures, especially in relation to who can do what in civil society and government in general.

3. WHAT CAN HOUSEHOLDERS DO?

3.1. Summary

Danish householders can reduce their risks of being burglarized by installing and *using* multiple but simple *barrier* devices, such as window locks, double (deadbolt) door locks, and a security chain inside any external door, as well as by making homes appear to be occupied, such as setting lights on a timer (both inside and outside). There is no clear evidence, however, that burglar *alarms* prevent burglary, and some evidence that alarms may even *increase* the risk of burglary. While most burglary in Denmark occurs in isolated cases, the greatest risk of burglary is in a home that has just been burgled recently; burglars often return to the scene within 14 days. There is also a higher risk to any home nearby another home that has just been burgled. Adding and using multiple security devices is especially important in the two weeks after each burglary.

3.2. What Works

3.2.1 Improvements in home security using multiple methods.

The evidence for this conclusion comes from three Level 3 tests, all conducted in the UK in the late 20^{th} Century.

The first was a rigorous 1978 test of "target hardening" in Northumbria (UK), a Level 3 study examining both reductions in burglary and potential displacement of burglary to other areas (Allatt, P., 1984. 'Residential security: containment and displacement of burglary.' *The Howard Journal of Criminal Justice*, *23*(2), 99-116). This large test with over 1500 households examined the effects of "target hardening" for access control by householders resulted in a 52% reduction compared to controls. The security improvements were made in state-provided housing for low-income citizens, in which windows and doors had not been very secure during original construction. Crucially, the program was targeted on ground-floor dwellings, where over 90% of the burglaries were found to occur. "The aim was to secure all ground-floor points of entry against burglary." There was a high residents' take-up rate for the physical improvements offered, followed by the relative reduction in burglary. While some displacement was noted, the benefits of reduced burglary outweighed the small displacement counts.

The second test was Tilley, Nick, and Janice Webb. *Burglary reduction: Findings from safer cities schemes*. Vol. 51. Home Office Police Research Group, 1994. This Level 3 study found that a combination of improved door looks and removal of prepayment meters resulted in a 91 percent reduction in burglary compared to a control group, although no details are given about the control.

The third Level 3 test was part of the widely-cited Kirkholt burglary prevention project in Manchester (Forrester, Chatterton & Pease 1988). The project deployed a range of measures to reduce burglaries, including both tightened access control and reduced rewards by removing the coin-metered heating gas systems. The burglary rate in the area near previous burglaries declined impressively by 40% within 5 months compared to the rates prior to the project start. The repeat burglary rate (at already-burgled locations in the area) was reduced by 100%.

The specific benefits of each security measure were not tested separately in these programs, but more recent studies can provide some insight into what they might be in the 21st Century. A recent level 1 study of security devices in 37,416 households in England & Wales (Tseloni et al, 2014) calculated a "security protection factor" (SPF) for the most commonly used prevention methods, which is a simple correlation. It showed that homes with no security were seven times more likely to be burglarized than homes with any security. But it also found that multiple security devices in some combinations produce far higher SPFs than others. One combination that showed 20 times greater security from burglary than having no security devices (p.1) was this list:

window and door double-locks plus external lights on a timer or a security chain.

Taking individual security devices one at a time, the security protection factor was also higher for some devices than others, as the quoted Figure 1 from the study (p.8) shows below--with the surprising finding that homes with burglar alarms were more likely to be burglarized.

Figure 1: Security Protection Factor for Individual Security Devices, England & Wales (Tseloni et al 2014: 8)



This Level 3 study looked at the effectiveness of various security devices in the respondent's home, including burglar alarm, CCTV, door double locks or deadlocks, dummy alarm box, external lights on a timer or sensor, indoor lights on a timer or sensor, security chains, window bars or grilles and windows locks. The key findings of this study were the following:

• Individual and combined security devices prevent burglaries with entry more than attempts except for the triplet combination of indoor lights, window and door locks (IWD) and the addition to this of external lights and security chains (EIWSD), which has the converse effect.

• Individual security devices confer up to three times greater protection against burglary with

entry than no security. However, a burglar alarm (B) or a dummy alarm for attempts without the presence of any other device is counter-productive increasing the odds ratios of burglary.

• Combinations of security devices in general afford up to roughly 50 times more protection than no security. The study concluded however, that protection conferred against burglary does not consistently increase with the number of devices that make up the configurations.

In another Level 1 study, the role of poor security in burglary events seems to have declined over time in the UK. (Tilley, N., Farrell, G., & Clarke, R. V. (2015). This study found that for the 1996–1998 period in England and Wales, security-related burglaries declined 21% compared to 4% for burglaries with entry by other means. For the 1994–2003 period, burglaries that were security related declined 59% compared to 28% reduction for burglaries not related to security issues. The total decline in burglaries was thus mainly a decline in those where some type of security was overcome by forced entry. From this, in conjunction with the other evidence, the authors think it reasonable to infer that this was due to improvements in the quality of the security.

In addition, further evidence in support of using security measures was published by the Swedish National Council for Crime Prevention (Grove, Louise E., G. Farrell, D. Farrington & S. Johnson. 2012. *Preventing repeat victimization. A systematic review.* Brottsförebyggande rådet/The Swedish National Council for Crime Prevention (© Brottsförebyggande rådet).

The Swedish Council's meta-analysis of interventions for residential burglary and commercial burglary in 27 studies often found an initial security survey followed by improved security implemented at properties in need. This typically involved improving locks on vulnerable doors and windows, but also other techniques such as reinforcing doors. Alarms were occasionally given or loaned to victims. The two main outcome indicators were the change in repeats and the change in the overall level of crime.

The study found on average crimes increased by 20-25% in the control condition compared to the intervention condition, or conversely, crimes decreased by 17-21% in the intervention condition compared to the control condition (per cent depends on method of calculation). The weighted mean effect size suggests that the interventions to reduce burglaries were effective. On average, crimes increased by 25.8% in the control condition compared to the intervention condition, or conversely crimes decreased by 20.5% (using 1/1.258) in the intervention condition compared to the control condition.

Householders Preventing Repeat Burglaries. The effectiveness of enhanced measures in the immediate wake of a burglary offers even stronger evidence than the effectiveness of security measures for primary prevention of burglary. A systematic review by Grove et al (2012) found 22 tests (at SMS Level 3 or higher) of security enhancements in the immediate aftermath of a burglary. Compared to control groups, the weighted average reduction of the rate of repeat burglary across these 22 studies was 17% to 20%. And as Johnson and Davies (2014) have shown in a powerful visual representation, there is good reason for homeowners to improve their security against repeat victimization in the immediate aftermath of a burglary.



3.3 What May Work

Householders may find it helpful to consider other possible means of burglary prevention, even if we cannot be as confident that they will work. The current body of evidence suggests at least four ideas, none of which is particularly costly in financial terms: keeping a dog, leaving lights on when the home is empty, blocking visibility and access to a rear garden, and increasing the amount of time that a human is present in the home.

3.3.1 Dogs. Early studies found that the presence of dogs (or appearances suggestive of dogs) in a residence were a protective factor against burglary (Reppetto, 1974: 84; Garofalo and Clark 1992). Most recently, the most rigorous test of this hypothesis has been provided by Montoya (Montoya, L., M. Junger, and Y. Ongena, 2016. "The relation between residential property and its surroundings and day-and night-time residential burglary." *Environment and Behavior* 48.4: 515-549), with a large Level 1 "case-control" study of 851 houses in Enschede, Netherlands. Half of these houses had been burgled in the period of 2008-2010; the other half comprised a random sample of all houses not burgled over the time period. The study's 6 observers examined all 851 homes from the outside in early 2010 without knowing which of them had been burglarized in the previous year. The study's overall analysis suggested that "territoriality" and access control were correlated with daytime burglary while access control and target hardening were correlated with night-time burglary. The study's overall conclusion was that two separate burglary prevention frameworks are needed to predict burglary at different times of day: day-time and night-time.

The specific evidence on dogs in this study suggested they were a protective factor against burglary. Observed evidence of a dog living in the home was coded from seeing either a Dog sticker on door or a dog either seen or heard. This evidence was over twice as likely (150% more often) to be found in the homes not burglarized as in homes suffering night-time burglaries (with less than a 5% chance of a false positive conclusion—i.e., a statistically significant difference). Evidence of a dog, however, showed no correlation with daytime burglary. The finding was all the more convincing since up to two years had elapsed between the burglary and the data collection; many burglary victims could have acquired a dog in the interim as a response to the burglary. Thus the absence of a dog as a risk factor could have been under-estimated. That risk seems more plausible than the opposite scenario: houses with dogs at the time of the burglary divested themselves of a dog because of the burglary.

The finding of a protective effect of a dog operating only at night confirms a conclusion of the Garofalo and Clark (1992) study: that a dog only deters burglars from entering when there are no humans present to hear the dog barking. This theory is distinct from a claim that

burglars are deterred by threat of a dog bite, which would seem just as plausible in daytime as at night. But since many homes are unoccupied in the daytime, the Enschede analysis suggests that evidence of a dog does little to scare off burglars when there are no people around. In other words, dogs only work like an alarm and not like an electric charge: they warn a human at home that a burglar is there, but when no one is home burglars do not seem to be deterred if the dog barks.

3.3.2. Lights. Similarly, indoor lighting should make little difference in the daytime (when it is largely invisible from outside), while the potential for lights to discourage burglars at night makes more sense in theory. Indirect evidence on that theory has long come from interviews of burglars in a Boston (Mass.) area prison (e.g., Reppetto, 1974: 84), about 14% of whom recommended lights as a way to deter burglars (compared to 45% recommending strong locks).

More direct evidence on lighting comes from Garafolo and Clark's (1992) Level 1 casecontrol survey of residents in Albany, Troy and Schenectady New York in 1984, which found 229 households that had been burglarized and obtained details on a randomly selected sample of 414 other homes that had not been burglarized. The New York sample included information on eight "proxy guardian measures," including indoor lights on a timer, outdoor lighting, and a dog. The study's statistical model found that the stronger such guardianship overall, the less like a home was to be burglarized. Even during a burglary attempt, "door entries were less likely to succeed when locks were in use, when special outdoor lighting was used, and when the doors were visible to neighbours or from the sidewalk" (p. 455). Yet outdoor lighting had no correlation with the success of attempted entries through windows, which were generally much more successful.

3.3.3. Concealing Back Gardens. The visibility of an entrance door to a home has sometimes seemed to be another protective factor a householder can control. In the Enschede study of 851 homes (Montoya, et al, 2014), however, that was not the case. This may suggest a difference in European burglary patterns compared to those in the US.

Robinson (1997), for example, examined burglaries at apartment complexes in Tallahassee Florida, a state university town with many unrelated students residing in the apartments. His study compared all 94 burglarized units (with a total of 96 reported burglaries) within the 51 apartment complexes in his sample, plus a random sample of 140 units in the same complexes that had no reported burglaries during 1993. He found a very strong link between the visibility of apartment unit doors and windows and the occurrence of burglaries. Observing these access points from the street, parking lots, laundry rooms or other parts of the complex all yielded the same result—less visibility, more burglary. This correlation was strongest for forcible entry, which presumably takes longer than the unforced entries that are common in student-occupied apartment units.

Yet low-density apartment complexes in Florida may have very different pedestrian patterns from more densely-populated European cities. Hence the Montoya et al (2014) study in Netherlands found no protective factor against burglary in visibility of a front door. Yet it did find that *high* visibility of a rear garden predicted *higher risk* of night-time burglary, against their theoretical model. They examined measures of both visibility into the back garden and physical access to it. Both variables independently predicted a higher risk of night-time burglary. In light of this evidence, the authors recommended that householders should be adding solid fences or plants to reduce visibility of back gardens. This is almost an open question,

save for the precision of measurement in the Enschede study and the cultural and spatial similarities to Denmark.

3.3.4. Someone Staying Home. A less culturally dependent idea has consistent confirmation in every test we have seen. The more time a home is occupied, the less likely it is to be burglarized. Human presence seems to be a powerful protective factor, as long as the doors and windows are locked. Reppetto's (1974: 61) Boston survey found that homes were more than twice as likely to be burglarized when the home was empty of people over 35 hours per week than when it was only empty 0 to 5 hours weekly. Waller and Okihiro (1978: 58) found that 69% of burglarized homes, but only 42% of non-burglarized homes (39% relatively fewer homes) were left unoccupied for over 47 hours per week—the equivalent of leaving the home empty to go to work at a fulltime job.

Yet Garafolo and Clark (1992: 458) found that even when the home is occupied, successful entry will be no less likely unless the occupant locks the doors and uses proxy measures of guardianship, such as lighting or a dog: "The likelihood of successful entry is reduced considerably only when primary guardianship is combined with locking of doors."

3.4. Open Questions. There are many open questions about burglary prevention for householders on which there is no evidence at all. These include remote CCTV monitoring, internet surveillance, motion detectors, and other newer technologies. Yet two older technologies have developed large markets of householders, who may spend substantial sums on the products. The evidence on both of these products leaves them in the "open question" category, solely because the findings are contradictory: burglar alarms and property marking.

3.4.1. Burglar Alarms. There are four well-measured tests of burglar alarms. Two show that alarms prevent burglaries; two show they don't. Of the four studies, two were led by the same criminologist, who reached opposite conclusions for different time periods in the UK. The evidence for the more recent period was that alarms do not prevent burglary.

The strongest evidence that installing home alarms reduces burglary comes from Newark, New Jersey (Seungmug Lee, 2007. *The Impact of Home Burglar Alarm Systems on Residential Burglaries*. Unpublished PhD dissertation, Rutgers University.) The study covered the period 2001-2004 in 90 census tracts, using city permits for using home alarms as the measure to correlate with burglary reports to police. This Level 2 study found that burglar alarms were effective in deterring residential burglary in alarm- installed houses and in diffusing the positive benefits of burglar alarms to houses in close proximity and the surrounding geographic area (X2 = 14.011** df=4, p<.01).

Two studies by Tilley et al (2015) find evidence both for and against the effectiveness of home burglar alarms (Tilley, N, R Thompson, G Farrell & L Grove, 2015. "Do burglar alarms increase burglary risk? A counter-intuitive finding and possible explanations." *Crime Prevention & Community Safety* 17.1: 1-19). Using annual national data from victimization surveys in England and Wales, this Level 1 correlational study sought to assess the marginal security effectiveness of a burglar alarm. Data from the 1992–1996 Crime Survey for England and Wales indicated the addition of alarms to otherwise similar configurations of security devices was associated with reduced risk of burglary with entry. In that period households with lights, window locks and alarms were nearly three times more protected against burglary than those with only the first two devices. Those with lights and alarms were nearly twice more secured from burglary compared with households with just lights.

In the 2008/2009–2011/2012 CSEW data however, a Level 1 analysis for that time period showed the presence of an alarm was associated with *greater* risks of burglary with entry. Comparing the patterns across the two time periods, the authors propose several theories to explain these findings, including the possibility that alarms serve as flags for the presence of valuable goods, or the diminishing returns associated with increased prevalence of household alarms. Whatever the reason may be, it would appear that alarms have become of diminishing value as additions to suites of burglary prevention devices.

Using the same data, with a somewhat different analytic approach, Tseloni et al (2014) analyzed the 37,416 households in England & Wales over the second time period as Tilley et al (2015), 2008-2012. As shown earlier in the Security Protection Factor (SPF) ratings, alarms and dummy alarms came out at the bottom among all security measures examined. Here again, in fact, the alarms were correlated with higher likelihood of burglary. While the measurement of when the alarms were purchased (before or after the burglary) may not be perfect, there now seems to be little reason to purchase a new burglar alarm in England and Wales; the same could be true for Denmark.

3.4.2. Property Marking. We have only been able to locate two studies of property marking, each contradicting the other. There may be "fugitive" studies of the effects of property marking—or even signs announcing that property has been marked--on homeowner burglary risks, but we cannot locate them. All we have is exactly what Eck (1997) reported two decades ago, reaching the same "open question" conclusion. The first is Laycock, G. (1985) (*Property Marking: a deterrent to domestic burglary?* (Vol. 3). London: Home Office.) This Level 3 study found a 62 percent reduction in burglary for households using property marking, compared with a control group not described in detail.

The second study is Gabor, T. (1981). The crime displacement hypothesis: An empirical examination. *Crime & Delinquency*, *27*(3), 390-404. This Level 3 study of property marking compared a control group (not described in detail) with a program in which participants engraved an identification number on moveable property (usually household property, although some commercial establishments were involved), and placed decals/stickers on the front and rear doors of their residence (or place of business) as a warning to prospective intruders. The program resulted in a 75 percent *increase* in burglary for the participants.

It is possible that property marking might work in a Danish context, but there would be no way to know that without conducting strong tests—preferably randomized controlled trials—in Denmark.

4. WHAT CAN NEIGHBOURHOODS DO?

4.1. Summary

Danish Neighbourhoods can reduce their risks of burglary by organizing and participating in a "neighbourhood watch," in which neighbours meet periodically to get to know each other by face and discuss the value of "target hardening" their security devices." They can also join together in a "cocoon watch" around any home that has just been burglarized, protecting all the homes in the immediate vicinity by looking out for non-residents in the area, locking doors and windows, and reviewing or upgrading security.

4.2 What Works for Neighbourhoods

Two strategies that neighbourhoods can use have been found to work in repeated tests. Those strategies are neighbourhood watch and closing off alleys behind houses with locked gates that only residents can unlock.

4.2.1. Neighbourhood Watch: Participating in a neighbourhood watch (NW) program can work, even though the amount of reduction in risk may be quite small. The evidence for this conclusion comes from three sources. One is a meta-analysis of Level 3 impact evaluations of neighbourhood watch programmes (Bennett et al 2008). A second is an original analysis of an unpublished randomized controlled trial (Pate et al 1987). The third is a re-calculation of the meta-analysis with the new RCT result added (Valdebenito 2016). The conclusion that NW can work, but with relatively small effects, withstands this analysis.

A Campbell Collaboration Meta-analysis: The effectiveness of neighbourhood watch

Bennett, Holloway, & Farrington, (2008) present the results of a meta-analysis testing the effectiveness of neighbourhood watch (NW) schemes at reducing crime. The meta-analysis is based on 12 studies producing 18 different effect sizes. Apparently, all the included studies are at SMS Level 3, involving before and after measures as well as one or more experimental/control areas (randomisation is not mentioned in any of the descriptions of the included studies).

As shown in Figure 1 from Bennett et al (2008), the overall impact of neighbourhood watch on reducing crime is Odds Ratio (OR)= 1.36; CI 95% 1.15 to 1.61 under a random effect model. Although the study reports the impact of the intervention (i.e., effect size) under a fixed and random model, the latter appears to be the most appropriate. As suggested by Borenstein, Hedges, Higgins, & Rothstein, (2009) the random effects model is the most precise when effect sizes are not homogeneous or consistently coming from a single population. The Odds Ratio of 1.36 can be thus be translated into a 26% reduction in burglary with NW compared to neighbourhoods without NW.

Figure 4-1. Forest plot of individual and mean effect sizes calculated by Bennett, Holloway, & Farrington, (2008. pp, 29) in the original meta-analysis

Author	Date	Outcome	OR	CI	Z	p of z
		measure				-
Cirel et al. (1977)	1977	Burglary	2.38	0.87-6.53	1.69	ns
Lowman (1983)	1983	Burglary	1.49	0.49-4.53	0.71	ns
Research and Forecasts Inc. (1983)	1983	Burglary	1.85	1.23-2.77	2.96	< 0.004
Henig (1984)	1984	Burglary	2.59	0.12-57.52	0.60	ns
Anderton (1985)	1985	Burglary	1.14	1.08-1.20	5.03	< 0.0001
Veater (1984)	1985	All crimes	1.75	1.38-2.22	4.61	< 0.0001
Jenkins and Latimer (1986) [1]	1986	Burglary	1.35	0.30-6.13	0.39	ns
Jenkins and Latimer (1986) [2]	1986	Burglary	0.10	0.01-1.80	-1.56	ns
Jenkins and Latimer (1986) [3]	1986	Burglary	2.85	0.13-63.52	0.66	ns
Jenkins and Latimer (1986) [4]	1986	Burglary	2.55	0.62-10.51	1.29	ns
Forrester, Chatterton and Pease (1988)	1988	Burglary	1.64	1.32-2.02	4.57	< 0.0001
Bennett (1990) [1]	1990	Burglary	0.92	0.27-3.11	-0.13	ns
Bennett (1990) [2]	1990	Burglary	0.51	0.16-1.65	-1.12	ns
Matthews and Trickey (1994a)	1994	Burglary	1.04	0.69-1.58	0.19	ns
Tilley and Webb (1994) [1]	1994	Burglary	1.50	0.65-3.50	0.95	ns
Tilley and Webb (1994) [2]	1994	Burglary	1.12	0.60-2.11	0.36	ns
Tilley and Webb (1994) [3]	1994	Burglary	1.28	0.67-2.46	0.75	ns
Matthews and Trickey (1994b)	1994	Burglary	1.17	0.82-1.69	0.87	ns
Total n=18						
Fixed Effects			1.19	1.13-1.24	7.25	< 0.0001
Random Effects			1.36	1.15-1.61	3.63	< 0.0004

Interestingly, column 3 in the figure above reports the precise outcome measured (dependent variable). In almost all of the cases, the outcome measured is "burglary" (except Veater, 1984 which reports a composite measure of "all crimes").

Since our outcome of interest is burglary, we have calculated the impact of the intervention excluding Veater 1984, leaving the result more precisely associated with burglary outcomes. *By doing this, the overall impact of neighbourhood watch is reduced to a 16% reduction* (OR=1.205; 95% CI 1.03 to 1.40). See Figure 2 below.

Figure 4.2. Forest plot of individual and mean effect sizes calculated by Bennett, Holloway, & Farrington, (2008. pp, 29) in the original meta-analysis. (Only Burglary)

Model	Study name		Stati	stics for ea	ch study			Odds	ratio and 95	5% CI	
		Odds ratio	Lower limit	Upper limit	Z-Value	p-Value					
	Jenkis et al 1986 (2)	0.100	0.007	1.384	-1.718	0.086	₩	-	-+		- I
	Bennette 1990 (2)	0.510	0.159	1.638	-1.131	0.258		I —	╉┼╴		
	Pate et al 1987 (Ccp)	0.711	0.517	0.977	-2.102	0.036			-		
	Bennette 1990 (1)	0.920	0.271	3.122	-0.134	0.894		-	_		
	Matthews etal 1994a	1.040	0.687	1.574	0.186	0.853					
	Pate et al 1987 (Cob)	1.111	0.808	1.527	0.648	0.517			-		
	Tilley and Webb 1994(2)	1.120	0.597	2.100	0.353	0.724			-		
	Anderton 1985	1.140	1.081	1.202	4.875	0.000					
	Matthews 1994b	1.170	0.815	1.680	0.851	0.395			-		
	Tilley and Webb 1994(3)	1.280	0.668	2.453	0.744	0.457			-		
	Jenkis et al 1986 (1)	1.350	0.299	6.102	0.390	0.697		-		- 1	
	Lowman 1983	1.490	0.490	4.530	0.703	0.482				-	
	Tilley and Webb 1994(1)	1.500	0.646	3.481	0.944	0.345			→■	.	
	Forrester et al 1988	1.640	1.326	2.029	4.558	0.000					
	Research 1983	1.850	1.233	2.776	2.970	0.003			1-		
	Cirel et al 1977	2.380	0.869	6.520	1.686	0.092					
	Jenkis et al 1986 (4)	2.550	0.619	10.499	1.296	0.195			-+	⊢	
	Henig 1984	2.590	0.118	56.705	0.604	0.546		I—			— I
	Jenkis et al 1986 (3)	2.850	0.129	62.998	0.663	0.507		I—		┏┥──	— I
Fixed		1.158	1.104	1.215	5.986	0.000		1	1		
Random		1.205	1.032	1.408	2.358	0.018			•		
							0.01	0.1	1	10	100
								Control		Treatment	

(Readers who are unfamiliar with forest graphs like Figure 4.2 can find an introduction at https://www.campbellcollaboration.org/images/presentaion/Graphical_Displays in Meta-Analysis_Tanner-Smith_2013.pdf). Basically, the further any square is from the centre vertical line, the bigger the effect of the treatment. If a horizontal line containing a square crosses the vertical line, however, the effect could be due to chance ("non-significant"). Finally, the diamond at the bottom is the weighted average (weighted by sample sizes of different studies) of the effects, which must also not touch the centre vertical line for the average effect to be not due to chance.

4.2.2. The Unpublished Randomised controlled trial

In the early 1980s, The Minneapolis Police and the Police Foundation cooperated in the first (and apparently only) randomised trial of NW, under the leadership of Professor Fred Dubow of the University of Illinois. Sadly, Professor Dubow died before the study was completed, but a distinguished Police Foundation scholar, Tony Pate, completed the analysis. (Pate, McPherson & Silloway, 1987. *The Minneapolis Community Crime Prevention Experiment: Draft evaluation report.* Washington, DC: Police Foundation).

The Minneapolis community crime prevention experiment (MCCP) involves the practical application of the citizen "block watch" tactic for crime prevention, including burglary. After some years of implementation, the strategy was evaluated to identify its impact on the reduction of crimes when it is newly implemented in a neighbourhood. The experimental evaluation was implemented in a period of two years and involved two different treatments.

One was simply called Community Crime Prevention (CCP) without a police officer, another was called Cop-of-the-block (COB) – and one control group (CON).

- CCP is a variant of MCCP: involves the recruitment of leaders and the organisation of citizens into block clubs. "[T]hese clubs are then to become the vehicle through which citizens' participation in a wide range of both individual and collective crime prevention activities" (pp. 1-2).
- COB involves the organisation of a block club plus one police officer assigned to the club as a permanent liaison (pp. 1-3). The officers join meetings with the community several times a year.
- CON: This is counterfactual with no treatment, selected by random assignment from areas that might have been organized by MCCP.

Sample

The sample included "Seven neighbourhoods, each containing three sub-neighbourhoods, matched to be as similar as possible with respect to racial composition, tenure status, income and other census data. [...] The three sub- neighbourhoods were randomly assigned to one of the two treatments or to the control group, such that each condition contained a similar set of seven sub-neighbourhoods, which themselves represented cross section of Minneapolis neighbourhoods" (pp.1-4)

Data

The study measured one panel dataset (same group of individuals measured before and after) and one cross-sectional dataset. The cross-sectional data involves independent samples of individuals living in the same area of the study at time 1 (T1) and time 2 (T2).

The panel data involved 372 participants in T1 and 375 in T2. The methodology for this analysis is described in an end note. i

Measures

Data was collected using a questionnaire with multiple measures. For the purpose of these calculations, we have used the measures of actual "burglary victimisation" (BURGVIC) not "fear of burglary" or "perception of burglary" or "worry about residence burglary".

DATA EXTRACTED FOR EFFECT SIZE CALCULATION

(Pate et al, 1987; Table 6.30, pp.6-43)

The measures of the variable for burglary victimization were extracted from the **panel data**. We have extracted means, standard deviations and sample size (Table 1). This data allows the calculation of standardised mean difference (SMD) which will be latter converted into OR, to make the effect size comparable with Bennett et al., (2008).ⁱⁱ

Time 1	Time 2					
COB: M=.138; SD=.346; N=109	COB: M=.138; SD=.346; N=109 (no					
CCP: M=.214; SD=.412; N=131	change) CCP: M=.122; SD=.329; N=131					
CON: M=.197; SD=.399; N=132	(reduction) CON: M=.174; SD=.381; N=132 (small reduction)					
	reduction)					

Table 4.1. Data extracted for effect size calculations

RESULTS

As reported in Figure 3, the COB strategy shows a negative and non-significant effect on the reduction of burglary (OR=.90; 95%CI .65 to 1.23; p>.05), meaning that the control areas register a small decrease in burglary whereas the treatment area (COB) remain the same level. This suggests that police engagement somehow backfired, perhaps by increasing crime reports to a known figure—or perhaps by encouraging residents to let down their own vigilance because they know a police officer is now attending to their block. Whatever the reasons, this randomly assigned treatment did not work, and was, at minimum, a waste of police time.

The CCP strategy reported a positive and statistically significant effect, meaning that in the Community Crime Prevention "block watch" areas burglary was reduced more than in the control area (OR=1.40; 95%CI 1.02 to 1.93; p<.05).

When combining both treatments, the overall effect is OR=1.12; 95%CI .72 to 1.74; p>.05, meaning that the areas where neighbourhood watch was operating report a small decrease in burglary. However, the overall results are not statistically significant unless the COB units are excluded.

Figure 3. Forest plot for the impact of COB and CCP at reducing burglary

Model	Study name	Statistics for each study					Odds ra	tio and 95	% CI		
		Odds ratio	Lower limit	Upper limit	Z-Value	p-Value					
	Pate et al 1987 (COB)	0.900	0.655	1.237	-0.648	0.517					
	Pate et al 1987 (CCP)	1.406	1.023	1.933	2.102	0.036					
Fixed		1.125	0.899	1.409	1.028	0.304			•		
Random		1.125	0.727	1.742	0.528	0.597			٠		
							0.01	0.1	1	10	100
								Favours Control	Fav	ours Treatm	ent

In a second step, we have combined Pate et al., 1987 with the results of the meta-analysis reported by Bennett et al. 2008. Figure 4 combines the 18 effect sizes reported by Bennett et al. 2008 plus the two effect sizes reported by Pate et al. 1987. The updated version of the original meta-analysis report and OR= 1.31; 95%CI 1.13 to 1.52; p<.05 under a random model. **Based on this result, the burglary decrease is now 24% (1/OR)**

Figure 4. Forest plot for the impact of NHW on crime reduction (Bennett et al. 2008 and Pate et al. 1987 combined)



Finally, we have produced another forest plot (Figure 5) involving the impact of NW on Burglary-only (i.e., excluding Veater 1984). The meta-analysis reports an OR=1.26; 95%CI 1.09 to 1.4. Based on this last calculation, NW reduces burglary by 20% (1/OR).

Figure 5. Forest plot for the impact of NHW on <u>Burglary reduction-only</u> (Bennett et al. 2008 and Pate et al. 1987 combined)

Model	Study name	Statistics for each study			ch study		Odds ratio and 95% Cl			
		Odds ratio	Lower limit	Upper limit	Z-Value	p-Value				
	Jenkis et al 1986 (2)	0.100	0.007	1.384	-1.718	0.086	k ₽₽1 1			
	Bennette 1990 (2)	0.510	0.159	1.638	-1.131	0.258				
	Pate et al 1987 (Cob)	0.900	0.655	1.237	-0.648	0.517				
	Bennette 1990 (1)	0.920	0.271	3.122	-0.134	0.894				
	Matthews etal 1994a	1.040	0.687	1.574	0.186	0.853				
	Tilley and Webb 1994(2)	1.120	0.597	2.100	0.353	0.724				
	Anderton 1985	1.140	1.081	1.202	4.875	0.000				
	Matthews 1994b	1.170	0.815	1.680	0.851	0.395				
	Tilley and Webb 1994(3)	1.280	0.668	2.453	0.744	0.457				
	Jenkis et al 1986 (1)	1.350	0.299	6.102	0.390	0.697				
	Pate et al 1987 (Ccp)	1.406	1.023	1.933	2.102	0.036				
	Lowman 1983	1.490	0.490	4.530	0.703	0.482				
	Tilley and Webb 1994(1)	1.500	0.646	3.481	0.944	0.345				
	Forrester et al 1988	1.640	1.326	2.029	4.558	0.000				
	Research 1983	1.850	1.233	2.776	2.970	0.003				
	Cirel et al 1977	2.380	0.869	6.520	1.686	0.092				
	Jenkis et al 1986 (4)	2.550	0.619	10.499	1.296	0.195				
	Henig 1984	2.590	0.118	56.705	0.604	0.546				
	Jenkis et al 1986 (3)	2.850	0.129	62.998	0.663	0.507				
Fixed		1.171	1.116	1.228	6.426	0.000				
Random		1.264	1.099	1.454	3.282	0.001				
							0.01 0.1 1 10 100			
							Favours Control Favours Treatment			

4.2.2. Alley-Gating. This tactic requires closing off "alleys" as wide as streets behind houses with locked gates that only residents can unlock. For UK- or US-style alleys as wide as small one-way streets, this approach creates a vast dent in both automobile and pedestrian traffic behind a house. We have two tests of this approach, both of which show that it has reduced burglary in the UK.

First, a Level 3 study in Liverpool (Bowers, K.J., Johnson, S.D. & Hirschfield, A. F. (2004). Closing off opportunities for crime: An evaluation of alley-gating. *European Journal on Criminal Policy and Research*, *10*(4), 285-308) examined the effects of closing off access to approximately 134 houses with each gate. A total of 3,178 gates were installed that protected 106 distinct blocks of adjacent houses, which each contained about 362 residential properties. The authors reported that results demonstrated, relative to a suitable comparison area, that burglary was reduced by approximately 37%. There was also a diffusion of benefit to properties in the surrounding areas, and the scheme was cost beneficial with a saving of £1.86 for every pound spent.

Second, a Level 2 study in Manchester (Haywood, John, Paula Kautt, and Andrew Whitaker, 2009. "The Effects of 'Alley-Gating' in an English Town." *European Journal of Criminology* 6.4: 361-381.) investigated the effects of restricting alleyway access by installing gates, commonly termed 'alley-gating'. These gates spanned alley entry points and keys were issued to scheme residents. In a before/after comparison there was a 35 per cent reduction in burglary ($\chi 2 = 28.03$, df 1), indicating that alley-gates significantly (p<.01) reduced the risk of burglary and that spatial displacement was minimal and limited to 200 metres.

A supportive (if less specific) Level 2 study reached similar results on alley-gating. (Donnelly, Patrick G., and Charles E. Kimble, 2006. "An evaluation of the effects of neighborhood mobilization on community problems." *Journal of prevention & intervention in the community* 32.1-2: 61-80.). In this study, an intervention known as the Five Oaks Neighborhood Stabilization Plan contained six elements: the defensible space plan, a home ownership program, social and recreational programming, housing code enforcement, coordination of community-based policing, and a revised organizational structure for FONIA (Five Oaks Neighborhood Improvement Association and the City of Dayton). The defensible space plan led to the closing of 36 streets at one end of the block with gates as well as the closing of 26 alleys. The gates prevent vehicular traffic but permit pedestrians or bicycle traffic on the open sidewalks. All elements combined resulted in a net reduction in burglary of almost 40 percent.

4.3. What May Work.

The evidence is less firm on several other interesting ideas for neighbourhoods, especially in relation to repeat or near-repeat burglaries: notifying neighbours of each new burglary, a cocoon watch around recently burgled homes, and CCTV on the outside of buildings in an apartment complex.

4.3.1. Notifying Neighbours: The role of neighbours in reducing repeat burglary

In the spirit of civil society, this section reports on something that has been tested by having police do the work, even though in many communities (such as the area around the Cambridge Institute of Criminology) the local residents do the work. The work is to notify all neighbours immediately of any burglary in their vicinity. The evidence to show that this works is admittedly embedded in multi-tactic tests, but it could be the primary reason for the overall benefits of that approach.

There is increasingly strong evidence that neighbours can help to prevent "near-repeat" burglaries in the vicinity of a recent burglary—simply by being notified that a burglary has occurred nearby their own home. These preventable burglaries are technically "first" burglaries for the neighbours, which may be prevented by making the neighbours more vigilant in their *own* homes—*even if they do not look out for suspicious activity near anyone else's home*. A notice of nearby burglary may cause neighbours to secure their own houses better, or it may also cause them to call police more when they are worried about a possible burglary, which in turn increases police presence that returning burglaries goes down when news of the first is circulated in the neighbourhood. But the fact that this effect has been found so consistently makes us confident that spreading the news of the first burglary in the area is a good use of time—whether done by neighbours or police, by face-to-face, mailbox notices or online social media. Thus we make an exception here by accepting repeated Level 2 findings, on the statistical grounds that a pattern of so many consistent findings of large effects is unlikely to be due to chance.

A key study here is one that was done by civilian police staff, but could easily be done by citizen volunteers in Denmark. The study was done by a UK police officer trying to drive down burglaries in his area, largely in conjunction with related tactics called "cocoon watch" and "supercocooning." That study (Rowley, 2013) is described in its chronological sequence below.

4.3.2. "Cocoon Watch." A "cocoon watch" is one in which a social and security "cocoon" is built by neighbours and police around the home of anyone who has just been burgled. This idea was first documented in one of the early UK burglary reduction projects, as noted earlier in this report, in Kirkholt, an area of Rochdale in Manchester (Forrester, Chatterton & Pease 1988, Forrester, Forrester, Frenz, O'Connell & Pease, 1990). The highly cited Kirkholt project included a "cocoon neighbourhood watch" as part of a range of measures introduced to reduce burglaries. The burglary rate in the area near previous burglaries declined impressively by 40% within 5 months compared to the rates prior to the project start. The repeat burglary rate (at already-burgled locations in the area) was reduced by 100%. While there were many elements of the program, one was clear engagement of neighbours in the wake of each burglary. That engagement was formalized in a system called "cocoon watch."

The 'cocoon watch' aspect of this study involved approximately six houses or flats closest to a burgled property being asked to look out for any suspicious activity near the burgled home. There was an incentive to neighbours to sign up to be part of a cocoon watch, as those who agreed to take part also received measures to increase their own home security, such as securing points of entry.

The difference between a cocoon watch scheme and a neighbourhood watch scheme is that neighbourhood watches are comprised of a larger number of households which look out for any suspicious crime related activity and anti-social behavior in general. By contrast, a cocoon watch, as used in the Kirkholt project, is set up as a response to a specific burglary to avoid a repeat of the crime in this specific location (Forrester, Chatterton & Pease 1988). Intentionally set up to be small, the households that formed part of the cocoon watch did so as either victims or neighbours of victims, thus having a close personal connection to the crime they wanted to stop from repeating itself. At the end of the Kirkholt project's first phase, some of these cocoon watches developed into home watches, with on average about 20 to 25 households attached to each home watch.

Caveat 1: Rival Theories. Other causes may have produced the Kirkholt effects. Although the Kirkholt project has been referred to as a success in building social capital by bringing together victims and neighbours, this process was only one of several interventions used to reduce burglary. Other measures such as target hardening through improving household security and the removal of coin meters from homes to pay for gas and electric heating were also involved. Therefore it is not possible to say what relative contribution the cocoon neighbourhood watch made to the decrease in burglary rates in that project (Tilly, 1993). What can be said is that the same reductions were found in other tests that did not include the target hardening, cash removal or other features.

The Kirkholt project was a 'problem solving' crackdown approach to burglary reduction focusing on repeats. The study introduced a number of initiatives using the information provided by offenders, victims and neighbours through interviews. There was a particular focus on reducing repeat victimisation houses, which were four times more likely to be burgled again than houses that had not been previously burgled.

The initiatives that were introduced simultaneously included:

- removing coin operated fuel prepayment meters from houses (49% of burglaries involved loss from these meters and in 27% of cases this was the only loss).
- improving security (based on information obtained from offenders, neighbours and victims).
- introducing property marking.
- neighbourhood watch.
- community support team (non police).

There was an overall burglary reduction from 316 to 147, up to 75% month on month reduction compared with the previous year and little evidence of displacement to the rest of the subdivision (Forrester et al. 1988).



Figure 1: Change in burglary rate 1986–1987 (%). Comparison of Kirkholt with rest of sub-division

(Forrester et al., 1988)

Forrester et al (1990: p 4) concluded:

"the rate of burglary on Kirkholt fell to 40% of its pre-initiative level within five months of the start of the programme. Repeat victimisations fell to zero over the same period, and did not exceed two in any month thereafter. The trend was in contrast to that observed in adjacent areas of Rochdale. However, there was no evidence that crimes had been deflected from Kirkholt to bordering areas."

It should be noted with respect to repeat victimisation:

"For purely statistical reasons, the reduction in repeat burglaries would have to be very much faster than the reduction in first burglaries to be significant. In short, the odds are stacked heavily against showing an effect peculiar to repeat victimisation. In our first report, no statistically persuasive reduction in repeat burglaries occurred over and above that achieved generally." (Forrester et al., 1990): p 4).

So while it is challenging statistically to show the effect of the crackdown on repeats specifically, versus a drop in general levels, a strategy targeting an area with extremely high burglary rate and targeting prior victims as well as increasing general guardianship and target hardening provided a substantial drop in burglary for the residents of the Kirkholt estate. It is unclear how effective each initiative was in isolation or what any interaction effects between the initiatives were.

Caveat 2: **Sustainability**. It has been reported that home watch schemes often lose membership support after a period of initial enthusiasm (Forrester, Frenz, O'Connell, Pease, 1990, Hussein, 1988) and may fail if no support structure, such as coordinators, regular meetings or communication structures exist. Yet since most of the risk of repeat burglary is found in the weeks after the last burglary, there may be no need for sustainability over a longer time period with no burglary. And with increasing evidence that burglaries do not only bring with them a high risk of repeat victimisation of the burgled property but that also houses nearby are at an increased risk of being burgled (being termed a 'near-repeat') in the days and weeks after an initial burglary (Bowers & Johnson, 2005), a more short term and specific strategy has recently been adopted.

4.3.3. "Super-Cocooning." This intervention is aimed at preventing repeat residential burglary victimization. It is focused on the nearby neighbours of any burgled home in the immediate wake of the burglary. It involves *face-to-face home security advice* to the neighbours of a burgled property as soon as possible, combined with *directed patrols to the areas* surrounding this burglary. It is based on the phenomenon that after a burglary has taken place, the burgled property as well as the houses in near proximity have a heightened risk of (repeat) burglary. The theoretical principle underlying this approach has been termed "the optimal forager" – it suggest that just like animal will try to maximize prey with the least amount of effort, a burglar will notice attractive targets on his/her way to a burglary and return to these properties soon after the initial burglary to conduct additional break-ins.

To date, six Level 2 evaluations have been conducted (Trafford, Leeds, Oxford, Reading and Milton Keynes, Birmingham) to test this concept. Results are available for two of these (Trafford and Leeds) and show very promising results and repeat and near-repeat burglary reductions up to 38% (Rowley, 2013).

The Trafford study (Fielding & Jones, 2012) evaluated a strategy involving patrols of areas of up to 400m surrounding a burglary and visits to up to 30 houses around the burgled property (or up to 400m surrounding the burgled property). The purpose was to raise awareness and

provide crime prevention advice to neighbours, as well as seeking information on any suspicious activities and provide information on police activity in combatting burglary in the area. The reduction in burglaries across the entire area during the 12 month intervention period compared to the 12 months before was 26.6% in contrast to 9.8% reduction across the whole of the police force in which the study was conducted (Greater Manchester Police). Yet some have argued that the trend in overall burglary is an imprecise indicator of whether the targeting of near-repeat burglaries was successful for those burglaries. We cannot say in the Trafford study whether that was true or not true.

The Leeds Study. We can, however, measure precisely where burglary declined when a similar "super-cocooning" strategy was rolled out by West Yorkshire Police in Leeds, UK. "Operation Optimal" in North West Leeds (Rowley, 2013) combined police staff making visits to 40 houses surrounding a burgled house within 24 hours after a burglary and directed patrols in areas of up to 400m surrounding the burgled property for several weeks. The cocooning visits were conducted by Police Community Support Officers with crime prevention training (rather than sworn police officers). The visits involved a) face-to-face interaction and engagement with the occupants of the 40 houses, to inform them of what had taken place and reassure them that they could take steps to prevent being victimized and b) a visual audit of the property and its surroundings with regard to risk assessment. Where necessary this included information on where to obtain the necessary support or financial assistance to purchase and install crime prevention hardware. Furthermore residents were also supplied with a home security booklet.

The Leeds intervention ran for 3 months in 2012. Its impact was assessed by comparing two units of analysis: a) the burglary count in the aftermath of each burglary in the 40 houses surrounding each property burgled in the 60 days after the first burglary in the experimental time period, and b) the same date during the same 3 months the year before. The impact evaluation found a reduction of 37.5 % in repeat or near-repeat burglaries during the experimental time period compared to the prior year. Further evaluation data made a similar comparison in a wider area around each "super-cocoon." Even as far out as 400m surrounding the initially burgled property—far beyond the areas for visits or patrols—a clear effect was found. For up to 15 days after the trigger burglary there was an 18.2% reduction in repeats/ near-repeats, compared to the same 3 months period the year before, at 400m.

The Leeds test of super-cocooning estimated that in the 3 months of the project duration, 318 burglaries were prevented (relative to the year before). By comparing the police staff costs for conducting the cocooning visits and the criminal justice costs of investigating and prosecuting burglary offences, it was calculated that for every pound spent on the cocooning efforts in this intervention £9.4 were saved.

Caveat 1. These effects were achieved by services provided by police agencies, not by neighbours. Yet the cost of having neighbours undertake to do the same things themselves could potentially be far lower. It is conceivable that a similar function could be fulfilled by providing community volunteers with crime prevention training to conduct home security assessments when informing neighbours of burglaries as they happen, so that local

neighbourhood leaders can provide home security assessments for the houses most at risk. Great care would be needed in testing such an approach, however, to insure that both trustworthiness and trust can be maintained when such inspections are performed by neighbours who could conceivably become burglars themselves. Householders may also object to persons from the community coming into their homes to conduct a risk assessment. Police officers or Police Community Support Officers or equivalents may be needed to provide higher authority to provide this advice.

Caveat 2: All cocooning projects to date included a combination of the cocooning visits with directed patrols, so it is impossible to distinguish the relative contribution of the cocooning visits and the patrols.

Caveat 3: The visits in these studies were conducted by Police Community Support Officers, not sworn police officers. These civilian staff members of UK police agencies undergo crime prevention training, but do not possess the same powers as police officers. In addition to dispensing crime prevention advice officers can also use this opportunity to provide valuable reassurance to the public and thus the police may wish to retain this role as it provides a teachable moment with a positive focus – helping the public to prevent a possible crime, rather than ask for information in the aftermath of a crime. It remains an open empirical question as to whether the police are essential in achieving these effects. This question may be addressed by a higher-level review of the repeat victimization approach.

Farrell and Pease (2007) completed a systematic review using Campbell collaboration protocols of repeat residential burglary interventions. Their conclusions on what works raise issues of implementation that are beyond our scope, but which every neighbourhood must consider. The findings were as follows:

"The most successful efforts [to prevent repeat burglaries in neighbourhoods] appear to involve: (1) A strong preventive mechanism. Specific prevention tactics should be tailored to and be crime and context specific. (2) Multiple tactics. The currently available evidence suggests multiple tactics working together can produce a synergistic effect. While there is little conclusive evidence regarding the effectiveness of particular tactics, opportunityblocking security aimed at preventing repeat residential burglary by the same modus operandi seems the most likely candidate for effectiveness. (3) Strong implementation. Some prevention efforts failed because the preventive mechanism was not introduced. (4) A focus on high-crime and high-burglary rate situations. Those times and places where rates of repeat burglary rates are highest are the most appropriate focus for prevention efforts". (Farrell and Pease 2007:173)

And conversely what may not work:

"This review suggests (and some of these are mirror-images of what works) the following characteristics of prevention efforts do not work to prevent repeat residential burglary: (1) Weak preventive mechanisms do not work. Further, the same prevention tactic in a different context does not necessarily work if the nature of the burglary problem is different. (2) Poor

implementation does not work. In particular, victim-education is an indirect route that does not necessarily mean that effective preventive tactics are implemented: some victims may be unable or unwilling to spend money on security. This suggests better sources of funding for security and other equipment or better motivation and incentives for victims may be required in some instances. (3) Replicating tactics without attention to context does not necessarily work, though some strategic application of measures, such as security upgrades to prevent repeat residential burglary by the same modus operandi appear more generally applicable. (4) Overall impact is less where repeat residential burglary rates are low. This is an issue that may hinge on the apparent disproportionate increase in repeat burglaries in the highest burglary rate areas." (Farrell and Pease, 2007: 173-174).

4.3.4. CCTV in a Multi-Building Apartment Complex. Finally, an idea for one kind of neighbourhood may apply widely in some areas of Denmark. The idea comes from one before/after Level 2 study of the installation of CCTV, including dummy cameras, in 15 UK housing complexes. This increase in surveillance was followed, at least in the short run, by a 79 percent decline in burglaries. (Chatterton, Michael R., and Samantha J. Frenz, 1994. "Closed circuit television: Its role in reducing burglaries and the fear of crime in sheltered accommodation for the elderly." *Security Journal* 5.3: 133-139.).

4.4. Open Questions About Neighbourhood Action Against Burglaries. No such questions were identified with evidence. Citizen patrols, block parties in the streets on national holidays, neighbourhood facebook pages and many other ideas might help to promote face-to-face social capital in neighbourhoods. Yet none of these or other possible ideas appear to have been evaluated for their effects on burglary.

5. WHAT CAN COMMUNITY GOVERNMENTS DO?

5.1. Summary. Local Governments may reduce burglary risks by taking civil actions against disorderly activities in or near any residential areas, which is a risk factor for burglary. They may also be able to increase enforcement of laws or codes requiring door and window locks in rental properties, and promote the use of multiple security devices in high burglary areas. They are unlikely to get any benefits for burglary reduction from increased street lighting. And while one US study shows lower burglary rates in gated communities of different income levels, that strategy backfired in South Africa and may be incompatible with Danish values.

5.2. What Works.

5.2.1. Civil Enforcement of Housing Codes in Disorderly Areas. Public disorder—noise, fights, drug-dealing, soliciting, etc.—is a strong predictor of burglary in the immediate vicinity (Sampson and Groves, 1989: 791). A 1982 study of 238 neighbourhoods using British Crime Survey data tested a theory of social disorganization. The result showed a statistically significant prediction of higher burglary rates where an index of social disorder was greater. It follows logically, if not by direct empirical evidence, that any program that can reduce social disorder in disadvantaged neighbourhoods could help to reduce burglary.

A program that succeeded in reducing disorder in Oakland California mobilized local government to use civil (non-criminal) enforcement powers on local properties generating disorder associated with drug dealing, illegal alcohol sales, noise and other problems. (Mazerolle, L. & J. Roehl (1999). *Controlling Drugs and Social Disorder Using Civil Remedies: Final Report of a Randomized Field Experiment in Oakland, California.* Washington DC: National Institute of Justice, US Department of Justice.). This Level 5 Randomized Controlled Trial assigned 100 street blocks to two groups of 50, a control group and a "Beat Health" project using building inspectors and others to uphold building codes. As the executive summary reports on this one-year project:

"Drug dealing was reported as a major problem prior to the start of the experiment in approximately three-quarters of the locations in both the control and experimental sites. Other complaints included rat and roach infestations, prostitution, trespassing, problems with pit bulls and or other animals, and other health and welfare issues. Formal actions taken by Beat Health officers at the experimental sites included.... inspections (n = 23), sending general warning letters (n = 9), sending [specific] warning letters (n = 13), issuing beat orders (n = 9), working with property owners to evict troublesome tenants (n = 19), and property clean-ups. During the 23 SMART inspections instigated against experimental target sites, city inspectors issued nine housing and safety citations, six vector control violations, two sidewalk citations, and one sewer violation. The city attorney's office did not file suit against any of the experimental site owners during the period of our experimental tracking (one year)."

The outcome analysis was based on 1,765,461 call incidents from January 1994 to March 1997. The result was "statistically significant differences when the experimental sites were compared to the control sites for changes in drug call incidents: while calls about drug

incidents increased for both groups, the experimental group increased by just over 10 percent whereas the control group increased by 66 percent in the mean number of calls per month when the pre-intervention period was compared to post intervention period."

While property crimes did not immediately drop in those areas, the long-term effect of bringing disorder down may well cause a reduced level of burglary. And since burglars may take much of the property they steal directly to drug dealers in exchange for drugs (see section 7 below), the nexus between a program that reduces drug dealing and a reduction in burglary may well succeed in Denmark. So what "worked" about this program was a reduction in drug-dealing, as an indirect cause of burglary.

A second randomized trial reached the same conclusion in San Diego (Eck, John and Julie Wartell (1998). "Improving the Management of Rental Properties with Drug problems: A Randomized Experiment." *Crime Prevention Studies*, volume 9 (1998), pp. 161-185.) The study focused on "121 rental properties that had already been the target of drug enforcement [which] were randomly assigned to two approximately equal-size treatment groups, or to a control group that received no further police actions. One treatment group received a letter from the police describing the enforcement and offering assistance; the other met with a narcotics detective under threat of [civil] nuisance abatement [brought by non-police, city officials]. Results show more evictions of drug offenders for both treatment groups relative to the control group, but more evictions for the meeting group than the letter group. Property owners in the meeting group also had a sizeable reduction in reported crime within six months of the intervention." While no separate effects could be identified for burglary, a general reduction in crime could well include measurable burglary effects in a larger sample.

Finally, a systematic review found direct evidence that reducing disorder (albeit by policing) reduced burglary (Braga, A. A., Welsh, B. C., & Schnell, C. (2015). Can policing disorder reduce crime? A systematic review and meta-analysis. *Journal of Research in Crime and Delinquency*, *52*(4), 567-588). This review of 28 US and studies and two UK studies looked at community problem solving to address social and physical disorder at places (i.e., third party policing), including aggressive order maintenance targeting individual disorderly behaviors, and found a small impact for property crimes (d=.187; p < .05). From the 30 studies, however, only three were focussed in reducing burglary and only one was statistically significant (Std diff in means .336 p<.05).

5.2.2. The demonstrated effects of security enhancements noted in multiple studies above (including Allat, 1984 and Tilley & Webb, 1994) strongly suggest a role for local government. That role could be enhancing the level of compliance with high standards for security designs. Compliance could be fostered by *funding* enhanced window and door locks, *inspecting* rental properties for that compliance, or both. The evidence to suggest that such an approach could work is as follows:

• Meredith, C., & Paquette, C. (1992). Crime prevention in high-rise rental apartments: Findings of a demonstration project. *Security Journal*, *3*(3), 161-167. In this Level 2 before/after study, crime watch and target hardening in apartment building resulted in an 82 percent before/after reduction in burglary, though no comparison group was included in the study.

Teedon, P, T Reid, P Griffiths & A McFadyen, 2010. 'Evaluating Secured by Design • Door and Window Installations: Effects on Residential Crime'. Crime Prevention and Community Safety, 12:4, pp246-262. This Level 3 study compared housebreaking crime in households with Secured by Design (SBD) features with controls without SBD; measures were taken before and after installing SBD. In SBD households overall crime fell in each of the housebreaking categories with the largest drop appearing in attempted housebreaking (59 per cent) and in theft by housebreaking (18 per cent), with a decrease of 10 per cent in housebreaking with intent to steal. All these decreases were significant (p=.011, p=.016 and p=.003, respectively). There was no evidence of a difference in proportions of dwellings that experienced any housebreaking crime between the SBD and non-SBD groups before intervention (p=.481), but after intervention the same test produced a p-value of .008. Therefore, the evidence indicates that after intervention a higher proportion of dwellings experienced housebreaking crime in the non-SBD dwellings than in the SBD group. Taking into account the low number of housebreaking crimes on SBD dwellings in the study area, the installation of SBD doors and windows appeared to have had most effect in houses and multi-storey flats.

5.3. What *May* **Work.** Local governments have considerable influence over the nature of new construction of homes. The burglary evidence suggests two policies about homes that should help to reduce burglary risks:

5.3.1. Encouraging attached housing, with front gardens and no corners. In the detailed data on the Netherlands (Enschede), Montoya et al (2016: 18) show clear evidence that burglary risk is significantly and substantially lower for households in attached, rather than detached, structures. Similarly, the same can be said for houses with front gardens, which seem to create more territoriality around the premises that discourages burglars from entering the zone. Conversely, a house on a corner has fewer eyes on it; but corners are not necessary. Street designs might be able to bend or curve more so that every house is visible from other houses. Such decisions will always have many other considerations, but it is important for the evidence to be clear.

A Dutch Level 4 study found that daytime burglary is related to territoriality and access control. (Montoya, Lorena, Marianne Junger, and Yfke Ongena, 2016. "The relation between residential property and its surroundings and day-and night-time residential burglary." *Environment and Behavior* 48.4: 515-549.) Specifically the study found that having a front garden is associated with lower daytime burglary, while holding all other variables constant: they have a 0.46 times lower risk of being burgled than those that do not. Living in an undetached house is also associated with lower daytime burglary risk (RRR = 0.55). This study also suggests that the factor that is associated with higher daytime burglary is being a corner house: they have 1.97 times higher risk of being burgled than those not located at the corner of a street). Neighborhood stability reduces the likelihood of daytime burglaries (RRR = 0.89). Proximity to commercial establishments (i.e., activity support) and window screening (i.e., target hardening) were on the verge of statistical significance (RRR = 1.45 and 0.49, respectively).

The study indicates that night-time burglary is related to access control and target hardening. Being an un-detached house is associated with lower night-time burglary, while holding all other variables constant (RRR = 0.68). Window screening is also associated with lower night-time burglary risk (RRR = 0.44). There is a tendency for a visible back garden to be associated with higher night-time burglary.

5.4. Open Questions. One open question about the role of community governments is the growing interest world-wide in "gated" communities, where there is a controlled perimeter blocking access to anyone but residents or their guests. The evidence on this is contradictory across a very large difference of context and crime levels. The evidence suggests that this policy may work in the US (Addington & Rennison 2015; SMS: 1). At the same time, it seems to have caused more crime inside the gates in South Africa (Breetzke & Cohn 2013 SMS: 1; Breetzke et al 2013 SMS: 1).

Works: Addington, Lynn A., and Callie Marie Rennison. 2015. "Keeping the barbarians outside the gate? Comparing burglary victimization in gated and non-gated communities." *Justice Quarterly* 32.1: 168-192.

This Level 4 study compared burglary victimizations in gated and non-gated communities using data from the British National Crime Victimization Survey. A statistically significant and larger percentage of households in non-gated communities were burglarized compared to the counterparts in gated areas (1.3 and 1.0%, respectively). Gated community location reduced the likelihood that a household reported a burglary (AOR=.67, p<.001). All other things being equal, households in gated communities had a 33% lower odds of being burglarized than a similar housing unit in a non-gated community.

Does Not Work:

 a. Breetzke, G & E Cohn, 2013. 'Burglary in Gated Communities: An Empirical Analysis Using Routine Activities Theory'. *International Criminal Justice Review*. 23: 1 pp56-74.

This Level 1 correlational study examined the impact that gated neighborhoods have on rates of residential burglary in a South African community. The gated neighborhoods variable was found to have a positively significant effect on burglary rates (b = 1.551 and 1.527 in the day time and night time models, respectively; significant at p<.01), suggesting that residing in a gated neighborhood in this city actually increases the risk of burglary victimization, both during the day and during the night.

b) Breetzke, G, K Landman & E Cohn, 2013. 'Is It Safer Behind the Gates? Crime and Gated Communities in South Africa.' *Journal of Housing and the Built Environment*. 29: 1 pp 123-139.

This Level 1 correlational study identified what physical characteristics of gated communities differentiate between high and low burglary in these enclaves. Overall the density of burglary in gated communities was found to be over three and a half times that of the city as a whole (p<.001). Areas immediately surrounding gated communities also have higher densities of burglaries than that of the whole city, with both the 150 and 300 m intervals exhibiting values higher than the overall city values.

6. WHAT CAN NATIONAL AUTHORITIES DO?

6.1. Summary. National Government can reduce burglary risks by legislation promoting, requiring or funding simple residential security devices as a minimum housing standard, including window locks and timers for external lighting. They could also review the possible banning of the use of cash in purchasing often-stolen goods, such as smart phones, televisions or scrap metal.

6.2. Setting and enforcing residential building security standards. The evidence above that "target hardening" works is helpful, but not as convincing as a harder connection between construction and burglary risk. Evidence from the UK's Secured By Design scheme may be relevant to Denmark (Armitage, R., & Monchuk, L. 2011. Sustaining the crime reduction impact of designing out crime: Re-evaluating the Secured by Design scheme 10 years on. *Security Journal*, *24*(4), 320-343.)

This Level 3 study reports on research conducted over a 10-year period (1999–2009) into the effectiveness of the secure-by-design (SBD) scheme as a crime reduction measure. Utilising a variety of methods, the research aimed to establish whether residents living within SBD developments experienced less crime and fear of crime than their non-SBD counterparts; whether SBD developments showed less visual signs of crime and disorder than their non-SBD counterparts; and whether properties built to the SBD standard are able to sustain any crime reduction benefits over a 10-year period.

The study found a rate of 263 crimes per 1000 households within the non-SBD sample and 119 crimes per 1000 households within the SBD sample. This difference in rates was statistically significant (p<.05). No burglary dwellings were recorded against the SBD properties within this sample; however, 5 were recorded against the non-SBD sample. With the exception of criminal damage, rates for all crime categories analysed were higher within the non-SBD sample. A strong, statistically significant correlation was identified between the proportion of SBD houses on a street and the rate of crimes recorded there (p<0.05). This correlation was negative, suggesting that the lower the proportion of SBD homes on a street the higher the rate of crime. Similar correlations were identified between the proportion of SBD housing and the rate of burglary dwelling (-0.506), assault (-0.444) and criminal damage (-0.748), each of these correlations was statistically significant (p<.01).

National government could also look at the regulatory implications of more evidence from the Netherlands. (Van Ours, Jan C., and Ben Vollaard, 2010. "*Does regulation of built-in security reduce crime? Evidence from a natural experiment.*" Centre for Economic Policy Research, London.

This Level 2 study reports on a natural experiment on the effects of a large-scale government intervention in precautionary measures against acquisitive crime. As of 1999, all new-built homes in the Netherlands have to have high-quality locks and burglary-proof windows and doors. The researchers observed the year of completion of the home rather than the year the building permit was granted as there was a time lag between the two: data on time-to-

completion of residential construction projects collected by Statistics Netherlands showed that on average it takes two years to complete a home.

Taking the burglary rate prior to construction year 2001, findings suggest that the regulatory change reduced victimization of burglary by 26 percent. When suburbs are excluded (areas with a relatively strong increase in attempted burglary), the estimated reduction in victimization of burglary increased from 26 to 32 percent. Older homes outside the city tended to benefit from being located in the direct vicinity of new, well-protected homes. The estimated effect of a relatively large share of homes built in 2001 or later is positive at both the level of the neighborhood and the level of the municipality, with the first effect being statistically significant.

6.3. What May Work. There are two ideas that we have already noted, but seem to be most appropriate at the national level. Both ideas are about encouraging more construction of lower-burglary-risk housing. One type is attached single-family homes (Montoya et al 2014). The other type is high-rise housing, in which few burglaries are ever committed above the ground floor (Waller and Okihiro, 1978: 61).

6.4. Open Questions. The biggest open question for the national government in relation to burglary is beyond the scope of the present report, but not the next one: the nature and amount of investment in policing strategies that are targeted directly at burglary.

7. HOW CAN THE ECONOMIC RETURN ON BURGLARY BE REDUCED?

7.1 Summary Everyone can, in principle, discourage burglaries by refusing to purchase goods that may be stolen, although little research is available so far to guide the use of this principle.

7.2. What Works. We found no clear evidence of what works to reduce the financial incentives for burglary.

7.3. What May Work. There is some evidence that drug dealers play a major role in providing economic incentives for burglary. Any strategies that could disrupt the drug dealers' use of drugs as immediate payment for stolen goods could potentially make burglary less attractive to drug-using criminals. (Stevenson, R. J. & L. M. V. Forsythe (1998). *The Stolen Goods Market In New South Wales: An Interview Study With Imprisoned Burglars.* Sydney, NSW Bureau of Crime Statistics and Research.) Two decades ago, this New South Wales study pointed to the interrelationship between illicit drug use, burglary and the ways in which stolen goods are disposed of. It is based on structured interviews across 11 institutions in New South Wales with 267 imprisoned burglars who agreed to participate in the study (about half of those approached). The greater part of the interviews concerned stolen goods disposal.

Burglars who used heroin were substantially more active than those who did not (median rates of 13.0 burglaries per month for heroin users vs 8.9 burglaries per month for non-users). More than four-fifths of them reported spending some or all of their burglary income on illicit drugs: 70 percent stated that they had traded stolen goods for drugs, making this the most common way of disposing of stolen goods. Nearly half of those exchanging goods for drugs had done so within one hour of the burglary and almost all of them had done so within one day.

These findings suggest two possible strategies for police that could be supported by national government with both legislation and funding. The first strategy concerns a greater emphasis on focusing on drug dealers as the most likely holders of stolen goods, rather than the burglars themselves. Thus, when police have legal grounds for searching dealers' premises for drugs, they should be able to look for (and seize) potentially stolen goods as well. Increasing legal powers in this way might sufficiently disrupt the compensation system between burglars and dealers so that dealers would require cash payment and thus reduce incentives for burglars to steal goods. Such policies could even increase the effectiveness of property marking.

Secondly, government could ask for monthly reports on how stolen goods are being sold on. This intelligence can be gleaned from police interviews with suspected burglars or drug offenders. These interviews should attempt to update intelligence about the process of goods disposal in a coordinated way, rather than dealing separately with drug crime and property crime. When certain secondhand goods dealers are identified via these intelligence-gathering activities, they should be informed about their increased risk of detection because of enhanced targeting.

The NSW findings also suggest likely benefits from an educational approach for the public at large, in addition to moral arguments. The sale of stolen goods beyond those involved in drug dealing might be influenced by the evidence of the likely relationship between the locations where stolen goods are purchased and the locations from which they are stolen. It appears that buying stolen goods enhances the risk of anyone becoming a victim of burglary.

Two related policy questions might be considered. The first concerns the current regulatory frameworks of government concerning sales of goods through auction houses, markets and websites, and whether they are sufficient to influence the sale of stolen goods through these conduits. The second concerns whether information flows about descriptions of stolen goods can be improved nationally and, where relevant, internationally, at least between Denmark and its closest neighbours.

7.4. Open Questions. The central open question is why there has not been more research on some of the many efforts to disrupt the markets for stolen goods. If such research exists, it is very well-concealed. Our team searched for studies of attempts to cut burglaries by reducing the number of outlets or encounters for cashing in stolen goods, whatever the method. Key words were developed and electronic data bases identified (as reported below), with a total of 10,928 titles identified, 1,481 titles read, 20 abstracts read, 5 abstracts read with methods and results, and two studies included. Both studies provided a summary of results, but with no statistics, about a "Market Reduction Approach" with intensified auditing of pawn shops. One study found no before-after difference in burglary during a multi-year an effort to disrupt illicit markets. The other study found a small difference. Insufficient detail was provided in order to assess the level of treatment integrity or the baseline similarity of the comparison and treatment areas.

7.4.1. Systematic Search Methods

To conduct the literature review, one researcher ran a number of searches to identify impact evaluations of interventions intended to decrease the economic return from burglary through reducing the market for stolen goods. These included the following:

1. A preliminary search using Google deploying the following search terms 'burglary' or 'burglar' and 'market disruption' or 'market reduction' or 'second-hand' or 'fences'. The purpose of this initial scan was twofold. First, it allowed the researcher to identify and test the relevance of particular search terms by reviewing the search results. Second, it was intended to enable the researcher to identify two or three relevant articles with which to test a search strategy: a robust strategy with key terms would include these articles in its results. While this preliminary search did not identify any literature which was included in the review, it did uncover a report by the Home Office by Sutton, M., J. Schneider and S. Hetherington (2001) entitled *Tackling Theft with the Market Reduction Approach*. Crime Reduction Research Series, Paper 8.

London: Home Office. This report formed the basis of the snowballing search detailed below.

- 2. A targeted search of relevant databases. Following the preliminary search, a number of search terms were compiled as outlined in the attached spreadsheet. The researcher focused on Criminal Justice Abstracts, JSTOR, PsycInfo, Academic Search Complete, Wiley Online Library and Sociological Abstracts to identify impact evaluations of interventions designed to reduce the market for stolen goods. In addition, the websites of the Campbell Collaboration, CrimeSolutions.gov, the Swedish Council for Crime Prevention, Blueprints (University of Colorado), and the What Works Centre for Crime Prevention UK (College of Policing) were also searched. The search focused on English-language literature from all countries. No time frame was imposed on the literature search.
- 3. 'Snowball' searching. The aforementioned Home Office report identified in an early stage noted that evaluations on market reduction interventions were underway at the time of the report's publication, in 2001. As these evaluations were not identified in the search, the study team sought to locate them through google searches of the authors of the Home Office report and key terms related to the interventions which were used in the report.

7.4.2. Databases Searched and Studies Identified

The researcher electronically searched databases related to criminal justice and related areas of social science: Criminal Justice Abstracts, JSTOR, PsycInfo, Academic Search Complete, Wiley Online Library and Sociological Abstracts. A title/abstract search was employed, using the search string (burglar OR "property crime" AND "market disruption" OR fences OR "crime facilitators" OR "pawn shops" OR "second-hand suppliers" OR "stolen goods" OR "property marking" OR "market reduction" OR "network sales"). This process produced an excess of irrelevant results, totaling over 17,000 results. All 278 results from the search of Criminal Justice Abstracts were reviewed, with the first 200 results of the other databases (the first 100 results of JSTOR) also reviewed. Ultimately, none of the results reviewed by the research team were included in the review, either because the subject area was not relevant to the research question, or were not impact evaluations.

The researcher also searched Campbell Collaboration, CrimeSolutions.gov, the Swedish Council for Crime Prevention, Blueprints, and the What Works Centre for Crime Prevention UK, using simpler search strings due to the more rudimentary interfaces of these sites. This search did not identify any literature for inclusion in the review.

Finally, the researcher conducted a Google search to identify the evaluations referred to in the Home Office report but not identified in the database searches. The search used the string ("market reduction approach" and evaluation), and located another Home Office report and a book chapter describing an evaluation that the research team for both publications had conducted on interventions targeting the market for stolen goods conducted in two locations

in the United Kingdom between 1999 and 2002. These publications were included in the review.

Database	Search string
Criminal Justice Abstracts	(burglar OR "Property Crime" AND "market disruption" OR fences OR "crime facilitators" OR "pawn shops" OR "second-hand suppliers" OR "stolen goods" OR "property marking" OR "market reduction" OR "network sales").
Academic Search Complete	(burglar OR "Property Crime" AND "market disruption" OR fences OR "crime facilitators" OR "pawn shops" OR "second-hand suppliers" OR "stolen goods" OR "property marking" OR "market reduction" OR "network sales").
JSTOR	(burglar OR "Property Crime" AND "market disruption" OR fences OR "crime facilitators" OR "pawn shops" OR "second-hand suppliers" OR "stolen goods" OR "property marking" OR "market reduction" OR "network sales").
PsychInfo	(burglar OR "Property Crime" AND "market disruption" OR fences OR "crime facilitators" OR "pawn shops" OR "second-hand suppliers" OR "stolen goods" OR "property marking" OR "market reduction" OR "network sales"). Timespan: no restrictions. Database: PsychInfo
Sociological Abstracts	(burglar OR "Property Crime" AND "market disruption" OR fences OR "crime facilitators" OR "pawn shops" OR "second-hand suppliers" OR "stolen goods" OR "property marking" OR "market reduction" OR "network sales").
Wiley Online Library	(burglar OR "Property Crime" AND "market disruption" OR fences OR "crime facilitators" OR "pawn shops" OR "second-hand suppliers" OR "stolen goods" OR "property marking" OR "market reduction" OR "network sales").
CrimeSolutions.gov	(Burglar)
Campbell Collaboration Swedish Council for Crime Prevention Blueprints	(Burglar) (Burglar) (Burglar)

What Works Centre (Burglar)

Google

("market reduction approach" evaluation)

8. RESEARCH METHODS

8.1. Searching for Literature

This report consists of a series of more-or-less systematic reviews of literature in relation to the research questions posed by Trygfonden. As the methodology described in answering the final question about market disruption put it (Section 7), there are extremely precise metrics that can and should be used when the question is focused and there has been little literature discovered. That section describes the most systematic of our reviews in this report, covering what appears to have been completely new ground.

In other sections of the report, such as what homeowners can do to prevent burglary, we repeatedly drew on previous systematic reviews of subsets of the research question. Many of these had been identified by our Danish partners, prior to our engagement for this project. Others were areas we had explored for previous reports (Sherman et al, 1997, 1998, 2002), and in which little new literature had been discovered. Our major change in methodology was to break the exclusion line for studies done before the early part of this century. On many key questions concerning burglary, the best research evidence was and remains that published in the 1970s or 1980s. At that time, burglary rates were far higher than they are today—on both sides of the Atlantic. It is therefore understandable that criminology world-wide has focused on other matters of currently higher priority, such as terrorism, cyber-crime, migration and policing.

The full accounting of the research methods requires a transparent division of labour, listing all of our team members:

Lucy Strang devoted more time than anyone else to an extensive and systematic search process recounted in section 7, proving the negative to the extent possible: the absence of research on market disruptions affecting burglary.

Cristobal Weinborn reviewed all of the burglary prevention studies transferred to us from our Danish partners, excluding those which did not qualify as impact studies under the criteria of the Maryland Report (Sherman, 1997). He then did further searches, both using key terms and using snowball methods. The latter can be defined as a thorough review of the reference list in every article or report that is deemed to be eligible for use in the review. If a study not on the list appeared, by its title, to be potentially relevant to our research questions, then all of us, including Mr. Weinborn, tracked down the full text immediately.

Kent McFadzien was assigned the review of repeat burglary victimization studies, for which he used relevant key words to find reports from multiple countries.

Sara Valdebenito did not search for new studies, but re-analyzed one previously fugitive report (Pate et al 1987) and updated the most recent systematic review on neighbourhood watch.

Katrin Mueller-Johnson also focused on a set of assigned studies, those pertaining to the super-cocooning and especially the Rowley (2013) test that she had supervised for Rowley's master's thesis.

Professor Heather Strang kept the registry of studies that were being considered for inclusion with summaries for Professor Sherman's review and co-wrote segments of the report. She was also the manuscript managing editor

8.2. Analyzing the Findings

In the end, the analysis largely followed the rules described in the Maryland Report (Sherman, et al, 1997), with some modification. In this report, as in others, we are unable to create comparable effect sizes across many studies since they lack the necessary reporting of the data elements, such as standard deviation. Nor could we hold on to the standard of two or more level 3 studies to show what works, since almost nothing would have been included with that rule. Allowing one study at Level 3 to be supported by another study at Level 2 was a compromise that allowed some information to become superior to none.

Yet all of the conclusions about what works have been founded on the usual conventions of two-tailed significance testing, with a p = .05 cutoff. We also defined the criteria for Levels 1-5 on the Maryland Scale in the same way as we have for twenty years.

In analyzing the research literature we deemed relevant, we took each question in the report as a challenge of both systematic reviewing and creative thinking. The links between civil enforcement and disorder, for example, are not a part of any standard bibliography on burglary. Yet the methods developed in Oakland (Mazerolle and Roehl, 1999) may still have great promise for reducing burglary. They may also be joined up with the civil seizure of stolen goods from drug dealers. That is where the Level 5 standard that Mazerolle met can be linked to a plausible risk factor, such as Sampson and Groves' evidence on disorder and burglary.

In the end, we cannot say that any other group of criminologists would have reached identical results. Our search and analytic processes retained creative thinking, if only because there were so many research questions embedded in the assignment. Yet what results is a long list of things that can be done, or at least tested, to reduce residential burglary in Denmark.

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End Note

1. To identify the impact of the intervention, we have calculated a synthesis index or effect size of the difference, representing the change between time 2 and time 1. Consequently, the change in the burglaries from the baseline is computed by subtracting the means (*X*) as follows:

$$Y_{diff} = X_{T2} - X_{T1}$$
 (1)

2. Subsequently, the variance of the difference was calculated using equation two below (Borenstein et al., 2009), where V_1 and V_2 represent the variances of the original point estimates and *r* represents the pre-post correlation (.75) value:

$$VY_{diff} = V_{T1} + V_{T2} - 2r\sqrt{V_{T1}}\sqrt{V_{T2}}.$$
(2)