Accidental Dwelling Fires: Evaluated

University of Essex ImpacTeam, presented by Catalyst

Evaluating your impact in the community.
Evaluations: What would you like to know?

1. Purpose and utility of evaluations in Fire and Rescue Services
2. Evaluation of the effects of a prevention programme Accidental Dwelling Fires in Essex
3. Details of how evaluation insights have been incorporated into programme design moving forward
4. Evaluation toolkit developed to help design evaluations
Evaluations: Why Do We Need Them?

1. Lack of suitable baselines of programme success;
2. Insufficient data on input, unit input and performance;
3. Difficulties in demonstrating links between input, performance and improved frontline services;
4. Insufficient quality control prior to external reporting;
5. Lack of transparency over arms-length bodies’ reporting processes to trace progress.

--------The UK National Audit Office (NAO)
Evaluations: Common Concerns

• **Evaluation will divert resources away from the programme.**
  • Costs:
    • Typically 10%-20% of overall programme budget
  • Benefits
    • Streamline resources
    • Focus on “what works” for programme participants
    • Improve outcomes

• **Evaluation will be too complicated.**
  • Can be simple and straightforward.
  • Must be appropriate to a programme's service model, objectives, and resources.
Evaluations: Common Concerns

• **Evaluation will be an additional burden on staff.**
  - Can be incorporated into ongoing programme management activities.

• **Evaluation will produce negative results.**
  - Finding out “what does not work” allows resources to be allocated toward “what does work.”

• **Evaluation is just another form of programme monitoring.**
  - Programme monitoring assesses whether a programme is in compliance with specified performance standards (e.g., number of participants served).
  - Evaluation assesses whether expected outcomes were achieved.
Evaluation in the Public Sector

1. Find out ‘what works’ and ‘what does not work’.
2. Showcase programme effectiveness to the community and funders.
3. Inform decisions about programme refinements and resource allocation.
4. Improve frontline practice with participants.
5. Improve staff morale.
6. Increase accountability and transparency.
7. Increase a programme's capacity to conduct a critical self-assessment and plan for the future.
Cooperation: Key to evaluation success

• Strong desire to assess programme impact.
  • Both the ECFRS and UoE want to know how to improve people’s lives.

• Communication is open, honest, respectful and effective.
  • Regular exchange of ideas, concerns, and feedback on evaluation process and results.

• Outstanding Problem-solving ability
  • Understanding of organisational needs, flexibility, adaptability.
Accidental Dwelling Fires

• Area: Essex County (3,670 km$^2$; over 447,000 households)
• Study period: January 2009 - December 2017
• Sample size: 7,640 ADFs
• Data sources:
  1. Incidents (Data obtained from the Incident Recording System)
  2. Social-demographic data: Experian Mosaic groups Data
  3. Other data: population and household data was sourced from the Office of National Statistics and the Department for Communities and Local Government.
ADFs by day of the week (2009-2017)

Injury ADFs (n=924)
Non-injury ADFs (n=6716)
Accidental ADFs (total)
ADF's by incident call hour (2009-2017)

- Injury ADFs (n=924)
- Non-injury ADFs (n=6716)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Injury ADFs (n=924)</th>
<th>Non-injury ADFs (n=5765)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child (0-9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Youth (10-17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult (18-64)</td>
<td>50%</td>
<td>10%</td>
</tr>
<tr>
<td>Elderly (65+)</td>
<td>30%</td>
<td>20%</td>
</tr>
<tr>
<td>Person, age not known</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Not Known</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Not applicable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Presence of alarms in ADFs over years (2009/10-2016/17)

- **ADF incidents**
- **Total ADFs**

![Graph showing count of ADF incidents and total ADFs over years (2009/10-2016/17).](image-url)
Number of ADFs: Local Authorities (2016)
Distribution of ADFs: Tenure

- **ADFs**
  - Owned
  - Rented
  - Council / HA

- **Injury**
  - Owned
  - Rented
  - Council / HA

- **Kitchen**
  - Owned
  - Rented
  - Council / HA
<table>
<thead>
<tr>
<th>ADFs occurring in Essex in 2016:</th>
<th>Model 1 (all ADFs)</th>
<th>Model 2 (kitchen ADFs)</th>
<th>Model 3 (smoking ADFs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1 Households on low incomes living in social housing (<em>K51, N61, O68, O69</em>)</td>
<td>1.281***</td>
<td>1.380***</td>
<td>1.332***</td>
</tr>
<tr>
<td>Group 2 Transient singles (<em>G33, I43</em>)</td>
<td>1.072***</td>
<td>0.908***</td>
<td>1.113**</td>
</tr>
<tr>
<td>Group 3 Poorer older householders living in social housing (<em>M</em>)</td>
<td>0.877**</td>
<td>0.831**</td>
<td>0.930**</td>
</tr>
<tr>
<td>Group 4 Couples and young singles in modern starter homes (<em>H36, H37</em>)</td>
<td>0.924*</td>
<td>0.906**</td>
<td>1.040***</td>
</tr>
<tr>
<td>Group 5 Owner occupiers in older style housing (<em>J45, J46</em>)</td>
<td>0.827**</td>
<td>0.608*</td>
<td>0.985**</td>
</tr>
<tr>
<td>Group 6 Wealthier older householders living in more rural locations and on the edges of towns (<em>A01, A02, B05, D13</em>)</td>
<td>1.199***</td>
<td>1.068**</td>
<td>1.040**</td>
</tr>
<tr>
<td>Number of observations</td>
<td>668</td>
<td>521</td>
<td>168</td>
</tr>
<tr>
<td>Notes:</td>
<td>** p&lt;0.05; *** p&lt;0.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Social housing and benefits
Transient Singles
Poorer Elderly in social housing
Couples and young singles
Owners in older-style households
Wealthier older households, rural and town edges

Most and Least at-risk Groups

- Essex Baseline, (mosaic) %
- ADFs, %
- Injury ADFs, %
- Kitchen ADFs
- Smoking-related ADFs
Most and Least at-risk Groups

- Social housing and benefits
- Transient Singles
- Poorer Elderly in social housing
- Couples and young singles
- Owners in older-style households
- Wealthier older households, rural and town edges

Essex Baseline, (mosaic) %, ADFs, %, Injury ADFs, %, Kitchen ADFs, Smoking-related ADFs
Targeting at-risk Groups to Reduce ADFs

![Graph showing cumulative ADFs across cumulative households]
Targeting at-risk Groups to Reduce Smoking-Related ADFs
Example Programme Evaluation: Parish Safety Volunteers (PSV)

• Pilot project, Essex County Fire and Rescue Services (ECFRS) & Essex Police (EP)
  • Offsetting budget restrictions & organizational change by enlisting volunteers to deliver high quality emergency prevention support.

• Volunteers
  • Visited at-risk local homes and reviewed and informed households on fire and burglary safety
  • Empowered to refer to other services
  • Visit 240 homes in 10 months
Analysis

• Difference-in-difference regression analysis
• 2 dimensions: time and treatment
• 4 comparison groups:

<table>
<thead>
<tr>
<th>(treatment, time)</th>
<th>Before 2016</th>
<th>After 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>treated</td>
<td>(1,0)</td>
<td>(1,1)</td>
</tr>
<tr>
<td>untreated</td>
<td>(0,0)</td>
<td>(0,1)</td>
</tr>
</tbody>
</table>

• Estimation equation: \( y_{it} = b_0 + b_1x_{it} + b_2z_t + b_3x_tz_t + e_i \)
Results

- Estimation results for ADF incidence.
- Joint effects of treatment and time also given.

Table 1. Difference-in-Difference Estimation of Accidental Dwelling Fires

<table>
<thead>
<tr>
<th></th>
<th>Accidental Dwelling Fires</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSV Treatment</td>
<td>0.58***</td>
</tr>
<tr>
<td></td>
<td>0.22</td>
</tr>
<tr>
<td>Time</td>
<td>-0.33</td>
</tr>
<tr>
<td></td>
<td>-0.66</td>
</tr>
<tr>
<td>Treatment*Time</td>
<td>-0.48</td>
</tr>
<tr>
<td></td>
<td>-0.78</td>
</tr>
<tr>
<td>Total effect of treatment</td>
<td>-0.81</td>
</tr>
<tr>
<td></td>
<td>(0.42)</td>
</tr>
<tr>
<td>Total effect of time</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>(0.75)</td>
</tr>
<tr>
<td>Constant</td>
<td>5.15***</td>
</tr>
<tr>
<td></td>
<td>-0.18</td>
</tr>
<tr>
<td>Observations</td>
<td>1212</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Standard errors in parentheses

*** p<0.01, ** p<0.05
PSV: Cost-Benefit Analysis

Fires decreased in PSV-treated locations by .81 per locality per month
- From 5.73 to 4.92
- 4 fewer ADFs per 5-month period
- Cost of ADF: £51,129 (Manchester New Economy Model)
- Reduction in ADFs due to PSV: 51129*0.81*65 = £2691941.85
- Total benefit: £2,691,941.85 - £77,544 = £2,614,397.85
PSV: Cost-Benefit Analysis

- Fires decreased in PSV-treated locations by .81 per locality per month
  - From 5.73 to 4.92
  - 4 fewer ADFs per 5-month period

- Cost of ADF: £51,129 (Manchester New Economy Model)

- Reduction in ADFs due to PSV: \(51,129 \times 0.81 \times 65 = £2,691,941.85\)

- Total benefit: £2,691,941.85 - £77,544 = £2,614,397.85
PSV: Cost-Benefit Analysis

• Fires decreased in PSV-treated locations by .81 per locality per month
  • From 5.73 to 4.92
  • 4 fewer ADFs per 5-month period

• Cost of ADF: £51,129 (Manchester New Economy Model)

• Reduction in ADFs due to PSV: 51129*.81*65 = £2,691,941.85

• Total benefit: £2,691,941.85 - £77,544 = £2,614,397.85
PSV: Cost-Benefit Analysis

- Fires decreased in PSV-treated locations by .81 per locality per month
  - From 5.73 to 4.92
  - 4 fewer ADFs per 5-month period
- Cost of ADF: £51,129 (Manchester New Economy Model)
- Reduction in ADFs due to PSV: 51129*.81*65 = £2,691,941.85
- Total benefit:
  
  £2,691,941.85 - £77,544 = £2,614,397.85
PSV: Cost-Benefit Analysis

• Fires decreased in PSV-treated locations by .81 per locality per month
  • From 5.73 to 4.92
  • 4 fewer ADFs per 5-month period
• Cost of ADF: £51,129 (Manchester New Economy Model)
• Reduction in ADFs due to PSV: 51129*.81*65 = £2,691,941.85
• Total benefit:
  £2,691,941.85 - £77,544 = £2,614,397.85
Benefits for Essex Fire

• Strategic Planning
• Service wide acknowledgement via a Home Safety Steering Group
• Risk Modelling
• Prioritise the messages, promotion and delivery of the service
• Quality Assurance
• Personal KPI’s and Objectives within the appraisal system
Evaluating Safe and Well in Essex

Kieron Moir: Home Safety Operations Manager
Evaluation Process

Kieron
DG
SWOs

Safe and Well Visit takes place and EVAL 1 is left with resident to complete and return

Resident returns EVAL 1 to the Community Safety Admin Team at ECFRS HQ

EVAL 1 arrives back at ECFRS HQ and enters the evaluation/reporting process

EVAL 2 is sent out to residents who returned EVAL 1

EVAL 2 arrives back at ECFRS HQ and enters the evaluation/reporting process

Project Evaluation

Report/insight

Report/insight
Embedding Evaluation

Barriers...

• Evaluation is new, and sometimes scary to frontline staff
• “Some of the people we visit will be overwhelmed”, “Yet more paperwork?”
• We don’t get the return rate we want
When we talk about evaluation we will do so...

**Consistently** – every meeting/every 1:1

**Clearly** – How many people/what did the results tell us

**Challenging** – Is this challenging assumptions? Does what we see correlate with what we tell people?

**Constructive** – **always** reflect on how this *helps* us and is constructive to our team
Responses

Evaluation 1 forms returned

August
September
October
November
December

Returned
Not Returned
Channel Preference

54
47
90
129
146
110
## Who responds (where over 50 visits)

<table>
<thead>
<tr>
<th>Mosaic Type</th>
<th>No</th>
<th>Yes</th>
<th>Grand Total</th>
<th>% survey returned</th>
<th>Mobile call</th>
<th>SMS</th>
<th>Email</th>
<th>Post</th>
<th>Landline</th>
<th>Prefer not to be contacted</th>
</tr>
</thead>
<tbody>
<tr>
<td>F23 Solo Retirees</td>
<td>165</td>
<td>20</td>
<td>185</td>
<td>10.8</td>
<td>42</td>
<td>66</td>
<td>96</td>
<td>112</td>
<td>195</td>
<td>102</td>
</tr>
<tr>
<td>F24 Bungalow Haven</td>
<td>145</td>
<td>15</td>
<td>160</td>
<td>9.4</td>
<td>82</td>
<td>51</td>
<td>92</td>
<td>115</td>
<td>113</td>
<td>113</td>
</tr>
<tr>
<td>F25 Classic Grandparents</td>
<td>133</td>
<td>22</td>
<td>155</td>
<td>14.2</td>
<td>11</td>
<td>14</td>
<td>85</td>
<td>151</td>
<td>155</td>
<td>111</td>
</tr>
<tr>
<td>F22 Legacy Elders</td>
<td>106</td>
<td>11</td>
<td>117</td>
<td>9.4</td>
<td>91</td>
<td>57</td>
<td>86</td>
<td>138</td>
<td>103</td>
<td>115</td>
</tr>
<tr>
<td>A04 Village Retirement</td>
<td>81</td>
<td>16</td>
<td>97</td>
<td>16.5</td>
<td>0</td>
<td>30</td>
<td>92</td>
<td>127</td>
<td>89</td>
<td>115</td>
</tr>
<tr>
<td>N57 Seasoned Survivors</td>
<td>57</td>
<td>13</td>
<td>70</td>
<td>18.6</td>
<td>21</td>
<td>68</td>
<td>86</td>
<td>127</td>
<td>196</td>
<td>118</td>
</tr>
<tr>
<td>N58 Aided Elderly</td>
<td>62</td>
<td>1</td>
<td>63</td>
<td>1.6</td>
<td>93</td>
<td>30</td>
<td>95</td>
<td>113</td>
<td>167</td>
<td>104</td>
</tr>
<tr>
<td>E18 Dependable Me</td>
<td>56</td>
<td>5</td>
<td>61</td>
<td>8.2</td>
<td>47</td>
<td>54</td>
<td>96</td>
<td>101</td>
<td>64</td>
<td>120</td>
</tr>
<tr>
<td>E20 Boomerang Boarders</td>
<td>54</td>
<td>4</td>
<td>58</td>
<td>6.9</td>
<td>52</td>
<td>86</td>
<td>103</td>
<td>98</td>
<td>120</td>
<td>96</td>
</tr>
<tr>
<td>B05 Empty-Nest Adventure</td>
<td>52</td>
<td>4</td>
<td>56</td>
<td>7.1</td>
<td>59</td>
<td>73</td>
<td>99</td>
<td>123</td>
<td>100</td>
<td>92</td>
</tr>
<tr>
<td>K47 Offspring Overspill</td>
<td>49</td>
<td>5</td>
<td>54</td>
<td>9.3</td>
<td>94</td>
<td>71</td>
<td>100</td>
<td>112</td>
<td>59</td>
<td>98</td>
</tr>
</tbody>
</table>
Was the form returned?
Change in confidence – safe from fire

After visit
After 3 months
Change in confidence – safe from burglary
Change in confidence – safe from fall
Visit feedback

I have learned something today that will help me to live more securely from burglary in the future

I have learned something today that will help me to live more safely from fire at home in the future

I would recommend a Safe and Well Visit to friends and family

The Safe and Well Officer who visited me was friendly, polite and professional
What actions, if any, will you take to live safer from fire following your Safe and Well Visit?

- Test alarms every week: [Intention] 18, [Implemented] 16
- Make an escape plan: [Intention] 14, [Implemented] 12
- Close internal doors: [Intention] 16, [Implemented] 14
What actions, if any, will you take to live more securely from burglary following your Safe and Well Visit?

- Windows and doors secure: Intention 16, Implemented 18
- Security mark property: Intention 6, Implemented 2
- Ensure perimeter of house secure: Intention 14, Implemented 12
- Security lighting: Intention 10, Implemented 11
- Check ID: Intention 12, Implemented 10
• Lots of thanks and appreciation for service

• “People are amazed that this service is free and one suggested if you handed out cards more people would be safer. We were very satisfied with the visit. We also talked about being connected to care line since have key safe fitted.”

• “My thanks to the visiting officer for pointing out me potential trip hazards to me. My concern is as regards to trip hazards, because I am over 73 years old. I will have to be aware as to tripping on mat in sitting room and step outside the back door from the kitchen needs to be either removed or made to be stuck in. I can’t afford to keep paying for jobs to be done what I need doing. Unless if I give up smoking then I should be better off to get things done. I will try”

• “I do not understand why a fire and rescue service are speaking to people about burglary when this is a police matter. I am thankful for the installation of the smoke alarms but would be put off by having the safe and well visit in future. I felt like a child being taught how to suck eggs. Leave a leaflet by all means but do not treat people with intelligence as though they are stupid.”

• “Didn’t tick 5 - is anything 100% guaranteed.”

• “I am so so pleased with this service that has been provided. I can finally sleep well at night knowing that if god forbid the fire alarm does go off the vibrating pad and strobe lights will wake me up. Thank you for providing such an excellent service to me and my family.”
SPOTLIGHT TOOLKIT: WHAT IS IT?

- Interactive web-based platform
- Useful:
  - For practitioners, policy makers, 3rd-sector organisations, local authorities
  - At design phase, during delivery, after completion
- Series of questions forcing the user to define parameters and scope of a programme and its evaluation
- Produce:
  - Evaluation frameworks, guidelines, documents, protocols
SPOTLIGHT TOOLKIT: HOW DOES IT WORK?

Screen 1: Log in
View projects
Create new project

Screen 2: Add new project
Project title
Abbreviation

Screen 3: Additional Information
Brief description, rationale, materials, procedures, date

Screen 3B: Implementation
Questions determining randomisation/phasing/research design possibilities

Screen 4: Inputs, Outputs, Etc.
Identify and designate outcomes, objectives, etc.

Screen 5: Measures
Answer questions about how each input, output, etc., can be measured, including data sources and comparator groups.

Screen 6: People/Tasks
Answer questions about how each input, output, etc., can be measured, including data sources and comparator groups.

Extra Screens
Purpose/content
Authorship
Geographic scope
Timeframe and phase
Comparison group details
Information/consent details

Spotlight Products:
1. Terms of Reference (evaluation plan/design)
2. Table of basic project characteristics
3. Causal map (theory of change)
4. Task list (including project phase, responsible party/organisation)
5. Measurement plan
6. Data sharing agreement
7. Participant information leaflet
8. Consent form
Thank you !!!

Gina Yannitell Reinhardt, PhD: gina.reinhardt@essex.ac.uk

Andrea MacAlister: andrea.macalister@essex-fire.gov.uk

Kieron Moir: kieron.moir@essex-fire.gov.uk
Targeting at-risk Groups to Reduce Injury ADFs