Johns Hopkins Home Safety Study

Vision 20/20 Models in Fire Prevention Symposium

May 6, 2012
Center Faculty and Staff
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Community Partners
Baltimore City Fire Department, Environmental Justice Partnership, Mayor’s Office of Neighborhoods, Maryland Department of Health and Mental Hygiene, Urban Health Institute
• Burden of injury from fires and burns
• Formative evaluation
• Intervention development and delivery
• Process evaluation
• Impact evaluation
• Lessons learned
## 10 Leading Causes of Death by Age Group, United States – 2009

<table>
<thead>
<tr>
<th>Rank</th>
<th>&lt;1</th>
<th>1-4</th>
<th>5-9</th>
<th>10-14</th>
<th>15-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Congenital Anomalies</td>
<td>Unintentional Injury</td>
<td>Unintentional Injury</td>
<td>Unintentional Injury</td>
<td>Unintentional Injury</td>
<td>Unintentional Injury</td>
<td>Malignant Neoplasms</td>
<td>Malignant Neoplasms</td>
<td>Heart Disease</td>
<td>Heart Disease</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>2</td>
<td>Gestation 4,538</td>
<td>Congenital Anomalies</td>
<td>Malignant Neoplasms</td>
<td>Malignant Neoplasms</td>
<td>Homicide 4,802</td>
<td>Suicide 5,320</td>
<td>Malignant Neoplasms 12,519</td>
<td>Heart Disease 36,927</td>
<td>Heart Disease 67,261</td>
<td>Heart Neoplasms 391,035</td>
<td>Malignant Neoplasms 567,628</td>
</tr>
<tr>
<td>3</td>
<td>SIDS 2,226</td>
<td>Homicide 376</td>
<td>Congenital Anomalies 195</td>
<td>Suicide 259</td>
<td>Suicide 4,371</td>
<td>Homicide 4,222</td>
<td>Heart Disease 11,081</td>
<td>Chronic Low. Respiratory Disease 14,160</td>
<td>Chronic Low. Respiratory Disease 117,098</td>
<td>Chronic Low. Respiratory Disease 137,353</td>
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</tr>
<tr>
<td>4</td>
<td>Maternal Pregnancy Comp. 1,608</td>
<td>Malignant Neoplasms 350</td>
<td>Homicide 119</td>
<td>Homicide 186</td>
<td>Malignant Neoplasms 1,636</td>
<td>Malignant Neoplasms 3,659</td>
<td>Suicide 6,677</td>
<td>Suicide 8,598</td>
<td>Unintentional Injury 12,933</td>
<td>Cerebrovascular 109,238</td>
<td>Cerebrovascular 128,842</td>
</tr>
<tr>
<td>5</td>
<td>Unintentional Injury 1,181</td>
<td>Heart Disease 154</td>
<td>Influenza &amp; Pneumonia 106</td>
<td>Congenital Anomalies 169</td>
<td>Heart Disease 1,035</td>
<td>Heart Disease 3,174</td>
<td>Homicide 2,762</td>
<td>Liver Disease 8,377</td>
<td>Diabetes Mellitus 11,361</td>
<td>Alzheimer's Disease 78,168</td>
<td>Unintentional Injury 118,021</td>
</tr>
<tr>
<td>6</td>
<td>Placenta Cord. Membranes 1,064</td>
<td>Influenza &amp; Pneumonia 146</td>
<td>Heart Disease 97</td>
<td>Influenza &amp; Pneumonia 122</td>
<td>Congenital Anomalies 457</td>
<td>HIV 881</td>
<td>Liver Disease 2,481</td>
<td>Cerebrovascular 6,163</td>
<td>Cerebrovascular 10,523</td>
<td>Diabetes Mellitus 48,944</td>
<td>Alzheimer's Disease 79,003</td>
</tr>
<tr>
<td>7</td>
<td>Bacterial Septis 652</td>
<td>Septicemia 71</td>
<td>Chronic Low. Respiratory Disease 64</td>
<td>Heart Disease 120</td>
<td>Influenza &amp; Pneumonia 418</td>
<td>HIV 2,425</td>
<td>Diabetes Mellitus 5,725</td>
<td>Liver Disease 9,154</td>
<td>Influenza &amp; Pneumonia 43,469</td>
<td>Diabetes Mellitus 68,705</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Respiratory Distress 595</td>
<td>Chronic Low. Respiratory Disease 66</td>
<td>Benign Neoplasms 40</td>
<td>Chronic Low. Respiratory Disease 59</td>
<td>Complicated Pregnancy 227</td>
<td>Diabetes Mellitus 604</td>
<td>Cerebrovascular 1,916</td>
<td>Chronic Low. Respiratory Disease 4,664</td>
<td>Suicide 5,808</td>
<td>Nephritis 40,465</td>
<td>Influenza &amp; Pneumonia 53,692</td>
</tr>
<tr>
<td>9</td>
<td>Circulatory System Disease 581</td>
<td>Perinatal Period 58</td>
<td>Septicemia 33</td>
<td>Benign Neoplasms 45</td>
<td>Cerebrovascular 193</td>
<td>Cerebrovascular 537</td>
<td>Diabetes Mellitus 1,872</td>
<td>HIV 3,388</td>
<td>Nephritis 4,792</td>
<td>Unintentional Injury 39,111</td>
<td>Nephritis 48,935</td>
</tr>
<tr>
<td>10</td>
<td>Neonatal Hemorrhage 517</td>
<td>Benign Neoplasms 53</td>
<td>Cerebrovascular 42</td>
<td>Cerebrovascular 42</td>
<td>Chronic Low. Respiratory Disease 187</td>
<td>Liver Disease 459</td>
<td>Influenza &amp; Pneumonia 1,314</td>
<td>Influenza &amp; Pneumonia 2,918</td>
<td>Septicemia 4,628</td>
<td>Septicemia 26,763</td>
<td>Suicide 36,909</td>
</tr>
</tbody>
</table>

With more than 60,000 emergency department visits a year, fire and burns are also among the top 10 causes of non-fatal injuries for children from birth through age 4.
Injuries...represent a critical public health problem in Baltimore

Dr. Joshua M. Sharfstein
Secretary of Health for the State of Maryland
Former Commissioner of Health for Baltimore City

- Unintentional injury is the leading cause of death for ages 1-14 -- 38% due to fires

- Baltimore children ages 1-17 are four times as likely to die from residential fires as children nationwide
To develop an enhanced BCFD home visit program to increase the BCFD access to homes and the prevalence of smoke alarms, CO alarms, and safe hot water temperatures in Baltimore City.

To understand how the partnership worked and lessons learned that can help future efforts to promote fire department home visit programs.

To evaluate the enhanced home visit program compared to the standard BCFD home visit program.

To disseminate the findings to Baltimore communities, stakeholders in Baltimore City (Mayor’s Office, Fire Department) and the national fire prevention community.
## Johns Hopkins Home Safety Project Overview

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td><strong>Phase 1</strong>&lt;br&gt;Formative</td>
<td><strong>Pre-Study Activities.</strong> Met with community leaders and members; selected study areas; hired and trained staff; conducted focus groups with BCFD and community.</td>
<td>Completed, June 2009</td>
</tr>
<tr>
<td><strong>Phase 2</strong>&lt;br&gt;Formative</td>
<td><strong>Household Survey I.</strong> Completed 603 surveys in study areas to determine knowledge, attitudes and behaviors BEFORE conducting the home visits</td>
<td>Completed, July to December 2009</td>
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<tr>
<td><strong>Phase 3</strong>&lt;br&gt;Process &amp; Impact</td>
<td><strong>Sweeps Implementation.</strong> Conducted and closely monitored “standard” and “enhanced” home visits in study areas. Visited 8080 occupied addresses; entered 2,138 homes; 1,271 agreed to follow up.</td>
<td>Completed, April 2010 to April 2011</td>
</tr>
<tr>
<td><strong>Phase 4</strong>&lt;br&gt;Process &amp; Impact</td>
<td><strong>Household Survey II.</strong> Completed 759 follow up surveys in study area homes to determine knowledge, attitudes and behaviors AFTER participating in the home visits. Completed 279 surveys in homes that did not participate to measure dissemination of program awareness.</td>
<td>Completed, December 2011</td>
</tr>
<tr>
<td><strong>Phase 5</strong></td>
<td><strong>Partner Interviews</strong>&lt;br&gt;<strong>Dissemination of Results</strong></td>
<td>Now through June 2013</td>
</tr>
<tr>
<td><strong>East Baltimore Community</strong></td>
<td><strong>April 2008</strong></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
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<td></td>
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<tr>
<td>Two groups of East Baltimore community members (n=24)</td>
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<td></td>
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<thead>
<tr>
<th><strong>Baltimore City Firefighters Union</strong></th>
<th><strong>January 2009</strong></th>
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</thead>
<tbody>
<tr>
<td>One group with union leadership (n=13)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>East Baltimore Fire Departments</strong></th>
<th><strong>April-June 2009</strong></th>
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<tbody>
<tr>
<td>Nine stations in East Baltimore (n=52)</td>
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</tbody>
</table>
Selected Focus Group Results

What we heard
- Logistics of canvassing
- Lack of feedback from leadership

Recommendation
- Develop tracking tools and database
- Provide regular reports
Selected Focus Group Results

What we heard
More than smoke alarm installation is needed

Recommendation
Emphasize and value education about fire prevention and smoke alarm maintenance in addition to smoke alarm installation.

Encourage firefighters to spend time in the homes they visit interacting with residents about fire prevention.
Selected Focus Group Results

What we heard
Sense of entitlement perceived by some is frustrating and taints the program
Lack of personal responsibility
Challenges of poverty eclipse fire prevention

“You can't worry about a smoke detector if your lights aren't on or if you don't have anybody to watch the kids, or you don't have any food on the table.”

Recommendation
Reframe, refocus and provide resources
Community Focus Group Results

What we heard
Fire and fire prevention resonated with participants
Role of BCFD in East Baltimore
Home Visit Program

Recommendation
Take advantage of the goodwill that exists
Planned CARES initiative as a mechanism for strengthening the connection to the community
Our Response

Feedback to the Fire Department
• Presentation to leadership
• Written summary document

Partnership
• Revised training curriculum

Future Impact
• Improved canvassing program
• Stronger intervention
• Better quality data
Formative Evaluation – Phase 2

- Revised BCFD training curriculum and protocol for all home visits (a new Standard program)
- Developed materials and protocols for the Enhanced program
- Developed evaluation protocol and data collection tools
- Identified communities to receive the standard and the enhanced
- Determined the comparability of the selected standard and enhanced communities through a household survey
Map of our census tracts

Total # Homes = 9,768
<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Total N=603</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heard of the BCFD home visiting program</td>
<td>76%</td>
</tr>
<tr>
<td>BCFD home visiting program ever came before</td>
<td>71%</td>
</tr>
<tr>
<td>At least one working smoke alarm</td>
<td>86%</td>
</tr>
<tr>
<td>One working smoke alarm on every level</td>
<td>40%</td>
</tr>
<tr>
<td>Any alarms use 9-volt batteries</td>
<td>90%</td>
</tr>
<tr>
<td>Any alarms use lithium batteries</td>
<td>6%</td>
</tr>
<tr>
<td>Hot water temperature ≤ 120°F</td>
<td>57%</td>
</tr>
<tr>
<td>Working carbon monoxide alarm</td>
<td>28%</td>
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Standard and Enhanced Home Visit Program

**Standard**

- No pre-promotion in the community
- Trucks are scheduled to go door-to-door during specific blocks of time

**Enhanced**

- Community Health Workers promote upcoming home visit events 4-5 days in advance
- Mobile Safety Center parks in neighborhoods during home visit events
- Community Health Workers go door to door on the day of the home visit event in advance of the firefighters
Community Health Workers (CHWs)

• CHWs have been effective in promoting health services

• CHWs can bridge the cultural divide that contributes to health disparities

• CHWs have not previously participated in community injury prevention programs
CARES Mobile Safety Center – a longstanding partnership between Johns Hopkins and the BCFD
Standard and Enhanced Home Visit
What Happens Inside the Home

Standard JHSPH Activity
- Administer brief safety survey
- Give resident Safety Checklist & Resource Guide

Baltimore City Fire Department Activities
- Test all existing smoke alarms
- Install 10-year lithium battery smoke alarms on all levels
- Test CO levels
- Provide fire safety education

Enhanced JHSPH Activity
- Administer brief safety survey
- Provide safety education
- Give resident Safety Brochure, Safety Checklist & Resource Guide
- Refer resident to CARES mobile safety center
Process and Impact Evaluation - Phase 3
Home Visits in Progress
Process and Impact Evaluation - Phase 3
Home Visits in Progress
Results – Phase 3

171 Events
(8080 Occupied Addresses)

89 Enhanced
4048 Households
1628 Doors Answered (40%)

1214 Entered (75%)
414 Refused (25%)

2153 Alarms Distributed
1.9 per home

82 Standard
4032 Households
1588 Doors Answered (39%)

983 Entered (62%)
605 Refused (38%)

1663 Alarms Distributed
1.7 per home
Home is determined to be “safe” per number of working smoke alarms required by BCFD protocol

<table>
<thead>
<tr>
<th></th>
<th>Beginning of home visit</th>
<th>End of home visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1102 (52%)</td>
<td>207* (10%)</td>
</tr>
<tr>
<td>All alarms not tested</td>
<td>471 (22%)</td>
<td>172** (8%)</td>
</tr>
<tr>
<td>Yes</td>
<td>536 (25%)</td>
<td>1727 (82%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2108</strong></td>
<td><strong>2105</strong></td>
</tr>
</tbody>
</table>

*In 43 homes, resident refused installation on at least 1 floor. In 159 homes, BCFD did not install alarm on every level.

**In 22 homes, resident refused installation and in another 55 they reported HW alarm. In 52 homes, BCFD did not install alarm on every level.
Preliminary Results from Phase 4 – Six Month Follow-up

96% of installed smoke alarms were still operational at six month follow up*

*N=759 households
Results from Phase 5 - Partners Interviews*

- Partnership was well organized and managed.

- Fire prevention is an important issue for Baltimore residents and that time spent on it is time well spent.

- Opportunity for greater community involvement.

- Engaging the community during the dissemination phase of the project should be a priority.

- Additional communication in between meetings would have been both helpful and welcomed.

*In-depth interviews with 11 partners
Conclusions and Lessons Learned

• Homes in the enhanced community were significantly more likely to participate in the program and be fully covered by 10-year lithium battery smoke alarms.

• The use of CHW pre-promotion activities contributed to completing significantly more home visits.

• Communication and coordination are needed to minimize in-the-field issues (fire calls during events, disproportionate burden on some firehouses, lack of monitoring of compliance with protocol)

• Formative evaluation and effective partnerships were essential elements for success; time needs to be allocated to these activities
Two of the greatest virtues in life are patience and wisdom