COMMUNITY RISK REDUCTION

Outcomes

A GUIDE FOR MEASURING SUCCESS

Version 1.0

Vision 20/20

CPSE

Center for Public Safety Excellence

Outcomes

A Guide for Measuring Success

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Preface

Purpose of this Guide

This guide will focus on why outcome measures are important to determine if CRR programs are making an impact in the community. This information is intended to provide examples of various outcome measures to lower risks within the community and how they can integrate in a department's CRR plan.

Vision's 20/20's Risk Assessment Guide and Center for Public Safety Excellence's SOC can provide additional information when developing outcomes measures. An integral part of developing any outcome measure is access to good data. Without data that can be trusted it will be difficult to analyze problems when developing the proper measure to track. Developing a system of quality control for all data entered must be a priority. Without a method to ensure data is accurate in the decision-making process, valuable time could be wasted and worse, invalid conclusions might be made because of bad or incomplete data.

The intent of this guide is to offer suggestions to assist in developing outcome measures based on your organization's needs and its CRR programs. . Outcomes desired will depend on what you are trying to accomplish. In general, that is to reduce risks in measurable fashion, and we do so by applying the five E's in proactive fashion. The "E''s" commonly taught in CRR courses include emergency response; engineering; enforcement; education and economic incentives. In our everyday operations the "E's" translate into the regular services we offer: code compliance; public fire and life safety education; plan review programs; fire investigation programs; emergency response programs, and public policy changes that provide economic incentives or disincentives to stimulate behavior changes.

Each of these programs is designed to reduce or manage community risks in their own fashion. What follows are examples and are not a complete listing by any means. They are intended to stimulate the discussion about a focus on outcomes. And fundamentally, looking at outcomes means asking ourselves why we are doing something.

Why do we respond to an emergency? We don't respond to emergencies to do so quickly. We do so to mitigate damage from the emergency. So focusing on outcome measures, instead of outputs (like response time) illustrates the fundamental change to a way we view the value and importance of our CRR efforts. When we adopt that view, we realize there is more than one way to accomplish our ultimate goals of reducing risks in the communities we serve. Stipulating that our desire is to control the spread of fire, we can do so through effective emergency response, but also with building compartmentalization, fire sprinkler systems and fire alarm systems. A focus on outcomes begins by asking the question: why are we doing this? If our goal is to prevent fires and other emergencies from occurring or spreading, then we

can measure the results we achieve for all of the CRR activities we undertake. Why do we inspect commercial occupancies? To reduce hazards and ultimately reduce fire incidents. Why do we investigate fires? To determine the cause – so that the lessons learned from a fire incident may be applied to prevent other events. Why do we educate people about the hazards of everyday life? To raise their awareness of the hazards, and to do something to prevent them or to reduce the damage when they do occur.

Explaining Outcome Measures

According to businessdictionary.com an outcome measure is, "Determination and evaluation of the results of an activity, plan, process, or program and their comparison with the intended or projected results."[1] To develop outcome measures each organization must determine what risk they are trying to reduce and eventually measure to determine success or failure.

Outcome measures tell us if our ultimate goals of public safety have been reached by documenting changes in fire or medical incidents, dollar losses, injuries or deaths. We need to note that documenting changes in outcome measures need to be done over time because numbers can change from year to year due to random chance or other community variables.

The Center for Public Safety Excellence (CPSE) asks agencies to conduct a Community Risk Assessment/ Standards of Cover (CRA/SOC) to guide departments as they walk through the self-assessment and seek quality improvement for their organization. The entire accreditation process is based from this risk assessment.

As a department self-assess itself it will do so with the support of the current CRA/SOC and Strategic Plan. Agencies will ask themselves the four important questions as they seek quality improvement throughout the process: What am I doing?; Why am I doing it?; How well am I doing it?; and How can I make it better? There are 252 performance indicators (PI and each will be addressed by the organization describing what they are doing to meet the PI, analyzing it for effectiveness, identifying a plan for improvement, and citing references to support their position or claim.[2]

To determine outcome measures, an understanding of *Community Risk Reduction* (CRR) is necessary. What follows provides simple information what CRR is and why assessing risks are important.

Community Risk Reduction

To understand how to define outcome measures in your jurisdiction you must understand Community Risk Reduction (CRR).

CRR is defined by *Vision 20/20* as *a process to identify and prioritize local risks, followed by the integrated and strategic investment of resources (emergency response and prevention) to reduce their occurrence and impact.* Much of the current literature and training materials suggest that Community Risk Reduction programs use a six-step approach towards development. Figure 1 depicts these steps.

Importance of CRR

Community risk reduction is not a new concept for the fire service. Fire departments have been actively involved in fire prevention for many years through public education, building inspections and other activities. Although there is no specific blueprint for developing CRR plans in U.S. fire departments, there are some common and essential steps. Ultimately, the CRR plan will be unique to each fire department, based on the types of risks for that particular community.

Figure 1

Not only will a CRR plan be different for each fire department, but depending on the size of the agency it will vary from station to station. The risks in one station's area may be vastly different than an adjoining station based on various factors including demographics, type of residences (multi or single family homes), or commercial areas.

Essentially, the fire service exists not only to respond to emergency incidents, but also to proactively prevent or mitigate the impact of such incidents within their communities. CRR provides a more *focused* approach to reducing specific risks. In addition, a comprehensive CRR program involving community partners, firefighters, and other staff, can result in an organizational culture that recognizes the importance of reducing risks within a community. It is important that fire service leaders, their firefighters and other staff begin to shift their thinking towards reducing and mitigating risks, as this will ultimately be expected by their communities and elected officials. This will probably not be a simple or immediate change. As with any organizational culture—particularly within the fire service—there tends to be substantial resistance to what's new, and a strong investment in the old ways of doing things.

Center for Public Safety Excellence

The Center for Public Safety Excellence (CPSE) has developed a manual titled, *Community Risk Assessment: Standards of Cover* (CRA/SOC) for departments seeking to go through the accreditation process. This technical manual provides organizations with recommendations and guidance to develop a CRA/SOC for the jurisdiction and discusses how an emergency services organization provides service to their community.

A second document, *Fire and Emergency Service Self-Assessment Manual,9th Edition (FESSAM)* identifies performance indicators that agencies will self-assess themselves against before seeking a peer team to verify and validate their documents and processes. There are 10 categories, 45 criterion, 252 performance indicators of which 86 are core competencies.[4] Appendix B provides a crosswalk between Vision 20/20's *Risk Assessment Guide* and the accreditation process to assist departments when developing their SOC.

The CRA SOC details the importance of data collection when developing a risk assessment for the organization. The process asks the fire department provides service to look at all areas of the community they serve and are responsible for. Category 2A examines the characteristics of the area served by the organization. Core competency 2A.3 requires the agency to have a, "… documented and adopted methodology for organizing the response area(s) into geographical planning zones." These planning zones allow the organization to drill down into their date to identify trends, needs, and specific risks so the "Five E's" can be utilized to mitigate risks.

Development of planning zones allows an organization to focus on outcome measures to ensure programs provided by the organization to reduce risks are making a difference. Performance Indicator (PI) 2A.7 states, "Significant socio-economic and demographic characteristics for the response area are identified, such as key employment types and centers, assessed values, blighted areas, and population earning characteristics." This PI asks the organization to consider other associated demographic data for response areas, but can be utilized for risk reduction efforts.

Another PI, 2D.5 directly addresses risk reduction, public education, and community service programs. This indicator examines the, "Impact of incident mitigation program efforts, (such as community risk reduction, public education, and community service programs), are considered and assessed in the monitoring process." (See Figure 2).

Risk Defined

Definitions of "risk" can be found in a variety of publications, reports and other sources. One definition is: *human behavior, systems malfunctions, or an event that results in an ignition or other detrimental incident leading to a negative impact to life, property and/or natural resources.* Another simple definition is: *the potential or likelihood of an emergency to occur*. A "risk assessment" simply asks, "How risky is the situation?"

Risks that affect a community on a regular basis can be human-created or naturally occurring. Examples include preventable injuries, fires and frequently occurring forms of severe weather. Examples of more uncommon risks that may occur every 5–20 years, might include domestic terrorism, hurricanes, earthquakes, and major hazardous materials releases.

Risk assessment is basically the identification of potential and likely risks within a particular community, and the process of prioritizing those risks. It is the critical initial step in emergency preparedness, which enables organizations to eventually mitigate (if possible), plan, prepare and deploy appropriate resources to attain a desired outcome.

Degrees of Risk Assessment

The community risk assessment process can be as complex and detailed as local resources permit. Or, using basic skills and resources available to most organizations, can be a more simplified process that will produce basic information that can be used effectively for a CRR program. Several people or a small team may be most effective in completing the assessment. Many communities have access to experts in assorted occupations that can be useful in the process. Often, these individuals and organizations are very willing to provide assistance to the local fire department. Based on individual capabilities, each fire department and community will need to determine the extent to which they will conduct their risk assessment process.

CPSE asks departments to classify their risks and determine the appropriate response to mitigate the incident. Core Competency 2B.1 asks if, "The agency has a documented and adopted methodology for identifying, assessing, categorizing, and classifying risks throughout the community or area of responsibility."

Each organization can create and adopt their own risk assessment process, but should consider the following components:

- Hazard - Anything that can considered a peril or danger in the community
    - Human – Intentional, accidental, physiological, or psychological

  - Material – Hazardous material
  - Mechanical – Failure of equipment
  - Natural – Hurricanes, earthquakes, tornados, flooding, etc.
- Threat – The likelihood or probability of an event occurring in the community
- Consequence – Disparate significant outcome causing injury or loss in the community
  - Emotional – Loss of friends, family, property, fear or sadness, both short and long term
  - Economic – Loss of quality of life, jobs, property or tax revenue
  - Historic – Loss of community historic value
- Impact – The event's burden on the community regarding deployment and response. As an event grows, emergency resources are reduced are not available for response.
- Risks – Degree of potential danger or loss
  - Classification – Based on each program offer by the department (Domestic preparedness, fire suppression, EMS, technical rescue, hazardous material, aviation rescue and firefighting, marine and shipboard rescue and firefighting, and wildland)
  - Categorization
    - Low
    - Medium
    - High
    - Maximum

Core competency 2B.4 specifically asks the agency to provide, "… identification, analysis, categorization, and classification methodology … within each planning zone." The intent is that the agency categorizes and classifies risks into logical groupings to: reach the highest value and efficiency of a risk assessment and analysis processes; allows a consistent, adequate and capable deployment of resources; and to afford the largest opportunity to appropriately mitigate potential hazardous events prior to occurrence.[2] This allows for station based risk assessments for CRR

The risk assessment process not only provides a rationale for deployment of resources, but will help identify weaknesses in a pro-suppressions organization and drive the importance of outcomes in the community.

The Five "E's"

After developing the risk assessment, use of the five "E's" should be considered when creating outcome measures. Education, Enforcement, Engineering, Economic Incentives, and Emergency Response.

- Education - raises awareness and knowledge of fire safety, and is the first step of producing desired low-risk behavior
- Enforcement - Reduce risks (hazards) through legislation and its enforcement such as inspections with penalties for non-compliance
- Engineering - Modifying the product or the environment to prevent or mitigate injury and death
- Economic Incentives - Offered to encourage people to make certain choices, or behave in certain ways
- Emergency Response - Effective emergency response can mitigate the loss of an unintentional injury, and save lives

As a risk assessment is developed, use of the "5 E's" could provide guidance as the organization decides what should be measured.

Other Types of Measures

Measuring what we do each day and how that affects the services we provide take many different forms. Besides outcome measures, other types of evaluation include formative, process, and impact. Each of these different evaluations tools provide an organization the ability to process various types of data depending on the program or need.

Formative: the measures that describe the formative research done to help us focus desired changes. That can include a needs or a risk assessment which tells us things like fire incident rates, emergency medical incident rates, age, race and income of people affected so we know who is at highest risk. It can include incident response types, the time they occur, the location they occur so we know where our longest response times or most frequent use of the system are. It can involve more detailed examination of the demographics of the community involved so we know more about who is being affected by the emergencies we are called upon to mitigate either through an emergency response or proactive prevention efforts. The formative process includes the establishment of program goals and objectives, and development of materials and methods for intervention.

Process Evaluation: the measures that tell us how programs were implemented so we can quantify the number and extent of activities and resources committed to reaching the program objectives. Commonly we look at outputs – or the numbers of things done in this category of evaluation.

Impact Evaluation: the measures that tell us how much our programs helped to change the risks of our intended audiences. It is measuring things like changes in knowledge or behaviors, or changes in the environment (like smoke alarm installations, or home safety visits that identify and correct fall hazards

for seniors) that we know reduce risks. Impacts in this context are about risk – and do not necessarily affect outcomes.

Why Develop Outcome Measures?

Outcome measures are developed to determine if a program or practice is working, but why should outcome measures be embraced by fire and emergency services? Each year the organization's governing body approves a budget to provide funding to operate the agency. Does the funding allow the organization to develop and implement what they believe are the best strategies to improve services? Developing outcome measures permits the organization to determine if program activities are beneficial. Reason to develop outcome measures include:[3]

- Identify practices that are effective
- If a practice is effective, how is it measured?
- Identify any practices that need to be improved
- Provide documentation to the governing board their funding is working
- Assists in building transparency and understanding for the program

Outcome Measurement Examples

These examples are only some of many that fire departments can use when developing outcome measures. Each department has unique issues in their jurisdiction and will need to develop outcome measures for those situations. As Peter Drucker said, "What gets measured, gets managed."

Code Compliance Programs

- Measuring the total value of property losses in inspectable occupancies to fire in relation to assessed value (factored for inflation)
- Measuring the changes in the percentage of total fire losses occurring in inspectable occupancies (factored for inflation)
- Determining the changes in fire deaths/100,000 residents in inspectable occupancies
- Documenting the number of structural fires/1,000 residents in inspectable occupancies
- Measuring the number and type of occupancies requiring a re-inspection compared to the number in compliance

Public Fire and Life Safety Education Programs

- Measuring the changes in fire incidents for populations of special focus
- Documenting the changes in fire-related deaths in focused populations

- Measuring changes in fire-related injuries in focused populations
- Measuring changes in property damage costs in focused populations (factored for inflation)
- Measuring the number of fires in residential occupancies without smoke alarms (Occupancies by age and type of alarm).
- Measuring changes of juvenile fire setter incidents

Plan Review Programs

- Documenting changes in code violations of buildings properly reviewed when compared with others that were not
- Documenting changes in fire incidents in "reviewed" occupancies
    - This assumes a time frame between recent construction – and older properties that fall under a regular code compliance inspection cycle. In this context "reviewed" would be a building or portion that is approved for occupancy, and the time before it falls under a regular code compliance inspection cycle.

Fire Investigation Programs

- Documenting changes in percentage of fires where cause is determined
    - Assumes the outcome expected of investigation is to determine cause but quality control is important and can be affected by the quality (or lack thereof) of the investigation
- Changes in percentage of fire reports "cleared" without a determination of cause
- Documenting the number of fires found to be incendiary where cause is determined and successfully prosecuted if charged.

Emergency Response Programs

- Documenting changes in outcomes of incidents (e.g. improved cardiac arrest survival rates; improved efforts to confine fires to area of origin due to emergency response)
- Documenting a reduction of firefighter injuries, both during emergency incidents and non-emergency events or day-to-day tasks.
- EMS cardiac care: Percentage of STEMI patients with door-to-balloon D2B) time < 90 minutes
- EMS stroke care : Percentage of stroke patients with EMS door-to-door (E2D) time lass than or equal to 30 minutes
- VF/VT Cardiac Arrest neurologic outcomes with patients on the Modified Rankin Scale (mRs) between 0-2 of 0-3

- Documenting savings due to emergency response changes (e.g. reduced trips to emergency room where it is more expensive to provide care)
- Documenting lives saved or injuries reduced due to emergency response programs
- Documenting property saved – instead of lost – due to effective emergency response programs.
- Documenting fires mitigated by smoke alarms provided by the department or partner organization.
- Documenting the reduction of fire service and civilian injuries and casualties over a period of years.
- Documenting economic impact of a fire to include:
  - Occupant displacement. How long?
  - Employee layoff. How long?
  - Economic impact in loss of sales or property tax revenue
  - Replace, remodel or demolish. How long did this take?
- Documenting the condition upon arrival. Fire spread upon arrival as it relates to spread at extinguishment

Economic Incentive Programs

- Documenting the adoption and implementation of a specific economic incentive (or disincentive) like tax breaks for fire sprinklers, or fines for use of illegal consumer fireworks
- Documenting the outcomes of economic incentive (or disincentive) programs – like reduction of the use of illegal consumer fireworks; or increased installation of fire sprinkler systems

STEP 1

Using Your Tools

Data Collection

Using a record management system (RMS) to collect data can range from incident reporting, inspections completed, violations found and corrected, and public contacts. Maintaining accurate data of day-to-day operations is a necessary component of an efficient organization. An important aspect of data collection is a system of quality control to ensure the database is accurate. Without reviewing data entered into an RMS, the opportunity for errors increases, thus producing inaccurate information for decision-making.

The data comes in many different forms. It can come from the organization's RMS, U.S. Census data, local tax department, United States Fire Administration NFIRS data, or from a state.

Build a coalition. Many peer agencies outside the fire department are collecting data and it correlates with CRR. Through collaboration, this "big-data" can be used to help identify other measures not thought possible given the walls of our RMS systems, much like large corporations use it for marketing and sales. For example: police data (traffic collisions where and when), public health (vulnerable population groups (where and who). Ultimately by thinking outside the box, we may find similar factors associated with our problems and develop collaborative efforts for community improvement through risk reduction. Often by using additional data sources, external stakeholders may find it lends towards organizational credibility and collaboration.

GIS-Based Target Hazard Analysis

Target hazards should be contained in listings and/or maps (which distinguish target hazards from other structures) that depict the details and locations of the vulnerable areas and critical structures and facilities. Probably the most effective method of generating a target hazard analysis is the use of a GIS-based model. As mentioned previously, GIS is being widely used among local government entities.

Oliver suggests that a GIS-based assessment is comprised of four elements: [5]

1. Identifying/classifying community hazards.
2. Identifying risk factors, potential and probability.
3. Identifying/classifying community assets/values.
4. Fusing all of the elements into a visual display of the existing hazards: their potential impact on values, and the risk or likelihood of an unwanted event.

GIS has the ability to use data sources to develop visual views of risks that can be utilized to develop risk reduction plans to include deployment of resources (emergency response) such as station locations.

STEP 2

Putting It All Together

After you have collected and quantified your data, and prioritized the various risks, it will be necessary to distill it all into a legible and decipherable document. Keep in mind that the document may be reviewed by individuals, community partners, elected officials and others without technical expertise or backgrounds in the fire service and risk assessment.

Most spreadsheet or database software applications are capable of generating many different types of bar graphs, pie charts and line graphs. Word processing software typically enables the creation of simple or sophisticated tables that can be incorporated into your document. As mentioned previously, GIS can be very valuable by generating maps to illustrate locations and trends of incidents, hazards, and occupancies that document outcome measures.

The use of tables, graphs, charts and maps should be used to illustrate the results of your assessment. What follows is an example of a simple risk assessment of a fictional community in the United States. It includes a number of maps, tables and charts as examples of presenting your data visually.

Example

There are many different types of outcome measures to develop to determine if a program is reducing risks. The leading cause of fires in residential properties are unattended cooking fires. Data can provide the locations of fires while U.S. census can provide various demographics information to determine if any correlation exists.

Changing behaviors to reduce the incidents of cooking fires requires in-depth data collection. Expanding current type of data collected will be required to fully understand why this type of fire is occurring and how they can be prevented. Other data can include type of food, insured loss, number of occupants, actual income levels, etc. To collect this additional data will require a commitment from the organization since it is not required in a typical NFIRS report.

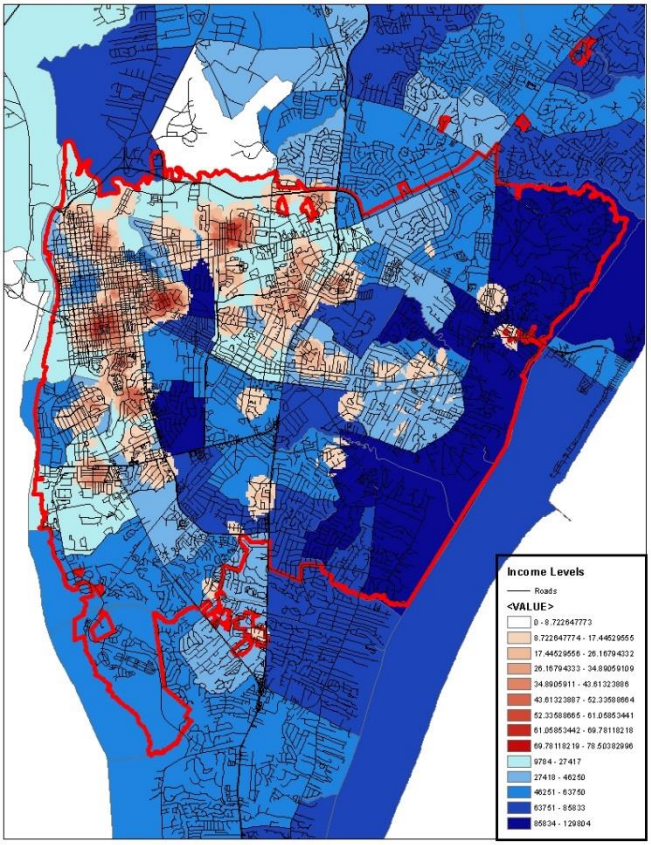

Figure 2

This is an example of a hot spot map showing locations of cooking fires and income levels. The map shows a correlation between the two types of data. The lighter the color, the lower the level of income, thus a greater chance of a cooking fire.

This data can provide an organization the visual information needed to develop a prevention or mitigation program to reduce the risk of a cooking fine. An outcome measure could be defined as, "Reducing the number of cooking fires in Planning Zone XX by __% over the next two years" or "Reducing fire loss from cooking fires by __% over the next three years."

The outcome measure will allow the organization to determine if the program is changing behavior and reducing the number of cooking fires or the amount of monetary damage.

Displaying the Data

Data collected after beginning the program(s) to reduce cooking fires and monetary loss must be reviewed on a consistent basis to determine if the actions implemented are meeting expectations. Collecting the data must become a priority for the organization. Without accurate data it will be difficult to determine if behavioral changes are occurring to meet the intent of the outcome measures developed. Quality control methods should be followed to ensure data integrity.

After collecting and determining the data is accurate, the information must be reviewed to decide if the program is working according to the outcome measure(s). After thorough review, the data can be placed into a format for viewing visually.

CRR programs are designed to reduce risks, not only for our customers, but for responding personnel. Figure 3 shows an example of a trend of lower fire alarms activations on a university campus. Multiple alarms can cause students and responders to become complacent when the occupants and responder assume the alarm is another malfunction or accidental activation. When an actual emergency occurs, complacency can lead to injuries or deaths when occupants don't leave the building.

Figure 3

Fire department personnel can put themselves and the public at risk when they respond emergency traffic to these types of alarms. There is additional wear and tear on apparatus and fuel usage during an unnecessary response.

Developing outcome measures to determine if a specific program targeting fire alarm activations is working requires proper data entry and analysis, which may require several years to see an actual trend. When a trend develops the department should examine what programs created the reduction in activations. The department should determine if further reductions are possible to establish new outcome measures to change behaviors, specifically related to college students. Students away from home for the first time may have minimal experience cooking and may cause false alarms when not properly monitoring their food. Data could differentiate between genders, year in school (freshman, sophomore, etc.), apartments or dorms, time of day, or day of week.

Communicating the Outcomes

Outcomes measures should be communicated whether the results are positive or negative. It could be as simple as an email to administrative staff or a more formal presentation to elected officials. Reducing risks enhances the community when the outcomes are positive and allows the organization to recognize those involved in the program.

If a presentation is given it is wise to invite the stakeholders which includes any partners that participated during the program. Media should be invited to provide information to the surrounding community regarding the risk reduction program and how it decreased the risks affecting the specific targeted group or area.

Useful Tools & Resources

There are some useful tools and resources that should be considered before undertaking the risk assessment process:

Human Resources—individuals both within and outside the fire department can be valuable resources. While firefighters may be tapped for their fire and EMS expertise, there may be individuals within the department with other unique skills, such as writing, graphic design, experience in statistical analysis, and other abilities. Private individuals and government employees with knowledge and skills in data analysis, population studies (demographics), crime rates, and other talents, should be sought out.

Word-processing software—an application such as Microsoft Word® will be necessary to document the results of your assessment in a format that can be easily read and interpreted by others, as well as for continuing the planning process. Most popular word-processors can incorporate images, create tables, and import information from spreadsheet applications.

Spreadsheet software—a computer application such as Microsoft® Excel or similar spreadsheet-type program will enable detailed analysis from a variety of data sources. A feature found in such programs is the ability to generate pivot tables from the information stored in the spreadsheet. Among other functions, a pivot table can automatically sort, summarize, count totals, or give averages of data. Pivot tables can make calculating and viewing data much quicker and simpler. Spreadsheet applications are usually capable of creating a wide variety of charts and graphs that can be used in the analysis and written reports. For those with limited or no experience with spreadsheet applications, it would be well worth the time to take a training course to learn the basics, including the use of pivot tables. Or recruit an experienced analyst from within local government or from a partner organization.

GIS software—a geographic information system application (GIS), such as *ArcGIS*® (Esri, Inc.), is an extremely valuable tool for conducting a risk assessment. More than just generating maps, it provides the power to manage data, perform advanced analysis, and much more. GIS applications can import incident data, demographic information, and other electronic records to produce a visual perspective of activity within your service area.

GIS software typically requires advanced training in order to utilize all of its features. Most fire departments do not have internal staff qualified to use such applications. However, many local government organizations have GIS departments or experts that can be recruited for assistance in

generating useful maps. For those who have access to *ArcGIS® Online*, Esri provides an add-in tool that will generate maps using Microsoft Excel® and, if desired, copied into PowerPoint® for presentations.

Conclusion

Outcome measures allow organizations a process to determine if their programs are effective. Many different tools are available to include a records management system, GIS, Excel, Pivot Tables, and word processing software. Each organization must decide the best tool to measure their data and decide if risks are decreasing because of their programs. Data integrity is a priority. As Drucker stated, "What gets measured gets managed."

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APPENDICES

Appendix A: List of Risk Assessment Resources

Training Programs

Executive Analysis of Community Risk Reduction (R0274)
U.S. Fire Administration (apps.usfa.fema.gov/nfacourses/catalog/details/707)

This 10-day course is the second course in the Executive Fire Officer Program (EFOP). The course is a mixture of philosophy and application--the value of the community risk reduction and the process of applying risk reduction to the community. It involves developing partnerships with the community to implement programs, initiatives, and services that prevent and/or mitigate the risk of human caused or natural disasters. Traditional fire prevention programs are addressed.

Leadership Strategies for Community Risk Reduction (R0833)
U.S. Fire Administration (apps.usfa.fema.gov/nfacourses/catalog/details/10441)

This 6-day course is designed to enhance knowledge and skills necessary to lead, manage and apply fire prevention strategies and community risk reduction initiatives at the local level. This course will give students tools and techniques to raise the level of importance for prevention within their organization. The course will demonstrate how fire prevention and other risk reduction initiatives can benefit them directly and individually.

Station Based Risk Reduction (R0673)
U.S. Fire Administration (https://apps.usfa.fema.gov/nfacourses/catalog/details/10709)

This new 6-day NFA course seeks to improve the skills of Company Officers (COs) to lead and conduct risk-reduction activities within the service area of their station/community. The course is both for the CO who is currently engaged in risk-reduction activities and the CO who desires to lay the foundation to start community risk reduction.

Best Practices in Community Risk Reduction (W0635)
U.S Fire Administration (https://apps.usfa.fema.gov/nfacourses/catalog/details/10591)
This two-day course demonstrates to students nationally recognized principles that, when used appropriately, can lead to community risk-reduction programs that can measure success in local communities. This course will give students the opportunity to explore programs from communities across the United States that have been showcased at Vision 20/20 symposiums. These programs demonstrate what nationally recognized organizations identify as examples of "best practices" in community risk reduction.

Demonstrating Your Fire Prevention Program's Worth (R0378)
U.S Fire Administration (https://apps.usfa.fema.gov/nfacourses/catalog/details/774)
This six-day course provides students with the tools and skills to be able to evaluate their organization's fire and injury prevention programs. The course provides a systematic way to improve and account for evaluation actions by involving procedures that are useful, feasible, ethical and accurate.

Advanced Technology for Community Risk/Standards of Cover
Center for Public Safety Excellence (CPSE) (www.publicsafetyexcellence.org/development-training/workshops.aspx)

Designed for accreditation managers and their GIS specialists, this one-day seminar (or five-week webinar) focuses on using GIS and related tools to conduct the analysis required to complete the CFAI Community Risk and Standards of Cover (SOC) process. The workshop covers the data necessary to use GIS and Excel software and produce the exhibits necessary for a defendable Community Risk/SOC study.

Publications & Other Documents

RHAVE and Community Risk Assessment for Volunteer Fire Departments
Ronny J. Coleman, Senior Fire Protection Consultant
A short paper discussing the Risk, Hazard, and Value Evaluation (RHAVE) tools.

Guide for the Evaluation of Fire Risk Assessments, 2013 Edition (NFPA 551)
National Fire Protection Association (NFPA) (nfpa.org)
This document identifies various types of fire risk assessment methods and describes the properties these methods should possess.

Funding Alternatives for Emergency Medical and Fire Services (FA-331/April 2012)
*U.S. Fire Administration/FEMA (*www.usfa.fema.gov/downloads/pdf/publications/fa_331.pdf)
The purpose of this manual is to identify the various grants and innovative funding alternatives available for emergency medical services (EMS) and fire protection services. Where appropriate, a discussion of the pros and cons of a particular funding source are discussed. In some instances, examples are given to illustrate how alternative funding is being successfully implemented in EMS agencies and fire departments across the country.

Addressing Community Wildfire Risk: A Review and Assessment of Regulatory and Planning Tools
The Fire Protection Research Foundation and National Fire Protection Association (NFPA)
(www.nfpa.org/~/media/files/research/research%20foundation/rfwuiregulatoryassessment.ashx)
A study that was conducted to review and assess the effectiveness of regulatory planning tools designed to address community wildfire risk, and to communicate lessons learned to communities considering such regulation. The project deliverables define the WUI regulatory landscape through the identification of regulatory tools, categorization of these tools, and their evaluation to clarify their effectiveness.

Managing Fire & Rescue Services
ICMA (bookstore.icma.org/PreviewPacks/pp42813.pdf)
Includes a chapter on community risk assessment and management.

Firewise Toolkit
National Fire Protection Association
(www.firewise.org/~/media/Firewise/Files/Pdfs/Toolkit/FirewiseToolkit.pdf)
Contains various information and tools concerning the NFPA's Firewise program.

Roles & Responsibilities of the Chief, Municipal Officials, & Citizens in Today's Protection Environment
National Fire Protection Association (NFPA)
(www.riskinstitute.org/peri/images/file/RolesandResponsibilitiesPERISymposiumPaper.pdf)
A short paper discussing the roles and responsibilities of public officials in community risk analysis.

Risk Assessment Worksheet: A Tool for Company Officers & Fire Prevention Inspectors
John Kobarda, London Fire Services, Ontario, Canada
A research paper developed to provide a risk assessment worksheet for the fire service.

Fire Risk Assessment Form
Fire Risk Assessment.com
Simple form for documenting potential fire risks.

Basics of Risk Assessment
U.S. Fire Administration
A one-page "coffee break" document discussing the basics of risk assessment.

Risk Assessment for CRR Effort
Mike Senchyna
A synopsis of methods promoted in the NFA's "Conducting Local Risk Reduction by Company Officers."

Internet Resources

U.S. Fire Administration/FEMA, Fire Prevention & Public Education:
www.usfa.fema.gov/fireservice/prevention_education/
Contains a wide variety of information and resources on community risk assessment.

Center for Public Safety Excellence: www.publicsafetyexcellence.org
Provides a community risk and standards of cover course. As part of the accreditation process, outlines standards for community risk analysis.

National Fire Protection Association (NFPA): www.nfpa.org
Website has a number of publications for download on risk assessment; particularly on wildfires, and other publications that must be purchased.

NFPA Firewise Communities: www.firewise.org
The Firewise Communities Program was developed in 1986 in response to the realization that the problem of home destruction from brush, grass and forest fires was one of national scope. The program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action to prevent losses.

Fire Risk Assessment, Fire Risk Assessment Guide: www.fire-riskassessment.com/fire-risk-assessment.html

A website that lists a step-by-step guide to doing a risk assessment, along with other resources. It aims to provide business owners and managers with online information and advice on a range of workplace safety issues that affect all business premises. This site does not sell any product or service, so the information provided will be unbiased as well as free. The information is provided as a free resource, not from the viewpoint of the fire authority.

Public Risk Management Association (PRIMA): www.primacentral.org
The website of an association dedicated to promote effective risk management in the public interest as an essential component of public administration.

International City/County Management Association (ICMA): icma.org
Provides a list of assorted fire service documents and resources.

Centers for Disease Control & Prevention (CDC), Injury & Violence Prevention:
www.cdc.gov/injury/index.html
Has a wide variety of information and statistics concerning traumatic injuries and violence. Also includes information on burn injuries and fire deaths. Other web pages include substantial information on heart disease, stroke and other diseases. It contains the WISQARSTM (Web-based Injury Statistics Query and Reporting System); an interactive database system that provides customized reports of injury-related data.

National Weather Service: www.weather.gov
Includes a weather safety web page, along with weather-related statistics concerning various weather fatalities and injuries.

Federal Emergency Management Agency (FEMA): www.fema.gov
Contains a wide variety of information on disaster planning and other disaster-related issues.

U.S. Energy Information Administration: www.eia.gov
Information, statistics and publications on commercial buildings; including building energy consumption.

Mesonet: www.mesonet.org
Real-time weather reporting for Oklahoma only. Has a specific page for public safety officials.

National EMS Information System (NEMSIS): www.nemsis.org
The NEMSIS Project is an effort to create a National EMS Database. The database will contain data from local and state agencies from across the nation.

National Center for Education Statistics, Common Core of Data (CCD): nces.ed.gov/ccd
A program of the U.S. Department of Education that annually collects fiscal and non-fiscal data about all public schools, public school districts and state education agencies in the United States.

United States Census Bureau: www.census.gov

Demographic data available for specific cities, towns and communities. Numerous other data on business, economics and housing.

Intterra: http://www.intterragroup.com
Company has multiple resources that can help with risk assessment; especially concerning wildfire issues.

Other Census Bureau web pages
American Housing Survey: www.census.gov/housing/ahs/
American Community Survey: www.census.gov/acs/www/
American Fact Finder: factfinder2.census.gov/faces/nav/jsf/pages/

Computer Software & Applications

Geographic Information System (GIS) for Public Safety
Esri (http://www.esri.com/industries/public-safety/fire-rescue-ems)
The company provides a number of tools and applications that could be potentially useful in planning and community risk analysis.

Target Hazard Analysis
Esri (http://solutions.arcgis.com/local-government/help/target-hazard-analysis/)
Used to identify and quantify properties that should be targeted for pre-incident planning to mitigate such a loss. Requires ArcGIS for Desktop (Standard or Advanced).

Lifestyles-Esri Tapestry Segmentation
Esri (www.esri.com/data/esri_data/tapestry)

VISION Risk Assessment
Emergency Reporting (www.emergencyreporting.com/products/vision.html)
Enables fire and emergency service agencies to analyze and categorize community risks and hazards. There are three different versions with various features.

Firehouse Analytics
Firehouse Software, Inc. (www.firehousesoftware.com/products/fh-analytics.php)
A multi-directional data analysis tool to evaluate the data collected from all modules of Firehouse (FH) Software. Must have FH software to utilize this module.

ImageTrend Fire Department Management System
ImageTrend, Inc. (www.imagetrend.com/products/eds/fire-bridge)
Fire service software that has add-on modules with an advanced visual analysis and reporting system, and a mapping and reporting system. Requires the basic system to utilize the add-on modules.

StatsFD
Animated Data, Inc. (www.statsfd.com)

Formerly *NFIRS 5 Alive*, the software utilizes existing raw NFIRS data to generate a variety of reports and analyses of community risks (based on occupancy and operational data) and operational performance. Generates heat maps and 3D geographic models.

FireView™ Dashboard
Central Square (https://www.tritech.com/communities/crimeview-fireview)
Allows users to analyze data by providing a snapshot of recent events displayed in the form of maps, charts and reports. It is a browser-based solution that can be customized to meet the needs of each user.

Appendix B: Vision 20/20 Risk Assessment Guide Crosswalk with CPSE's Fire and Emergency Services Self-Assessment Guide

Category	Criterion	Preformance Indicator	Core Competency	Vision 20/20 Community Risk Assessment (CRA) Guide	CRA Page #
II. Assessment and Planning					
	2A: Documentations of Area Characteristics				
		2A.3		1B: Develop a Community Profile	9
			2A.4	1B: Develop a Community Profile	6
		2A.5		1B: Develop a Community Profile	8
		2A.6		2A:Describe Risks Attributes &Risk Likelihood	14
		2A.7		2B: Rating (Scoring) Target Hazards	16
		2A.9		2B: Rating (Scoring) Target Hazards	16-17
	2B: All-Hazard Risk Assessment and Response Strategies				
			2B.1	2B: Rating (Scoring) Target Hazards	16
			2B.2	1A: Acquire Data that Identifies Risks	4-5
			2B.3	1A: Acquire Data that Identifies Risks	4
		2B.4		1A: Acquire Data that Identifies Risks	4
			2B.5	2B: Rating (Scoring) Target Hazards	16
			2B.6	1D: Identify Target Hazards	11
	2C: Current Reployment and Performance				
		2C.1		1B: Develop a Community Profile	6
		2C.2		1B: Develop a Community Profile	10
			2C.3	2B: Rating (Scoring) Target Hazards	17
		2C.4		1D: Identify Target Hazards	13
	2D: Plan for Maitaining and Improving Response Capabilities				
		2D.3		1D: Identify Target Hazards	11
			2D:4	1A: Acquire Data that Identifies Risks	4

Category	Criterion	Preformance Indicator	Core Competency	Vision 20/20 Community Risk Assessment (CRA) Guide	CRA Page #
			2D.5	1C: Identify Casual Factors & Population at Greatest Risk	10
	5A: Community Risk Reduction Program				
		5A:5		1A: Acquire Data that Identifies Risks	4-6
			5A:7	1C: Identify Casual Factors & Population at Greatest Risk	10
	5B: Public Education Program				
		5B:1		1C: Identify Casual Factors & Population at Greatest Risk	10-11
		5B:3		1C: Identify Casual Factors & Population at Greatest Risk	11
		5B:4		2A: Describe Risk Attributes & Vulnerability 2B: Rating (Scoring) Target Hazards	14-17