

Emergency Medical Services Cost Analysis Workbook Guide

Introduction

The purpose of this workbook is to determine the cost of an EMS system. It is meant to be used from a societal perspective, which means it accounts for all costs no matter who pays them. However, it can also be used to determine the cost of an individual agency, a group of agencies, or the incremental cost of a single intervention.

An EMS system is defined as all of the agencies that participate in acute, unscheduled healthcare outside the hospital within a defined geographic region. As such the cost of all agencies and services that are part of the community's EMS system should be included.

To make gathering this information as easy as possible, a worksheet is included for each type of agency (e.g., EMS, fire, police, communication center, hospital, etc.). This workbook attempts to capture the best estimate of EMS system costs, while at the same time not being so overly burdensome that it is impossible for a system to complete.

It is suggested that when a community is using this workbook to determine their EMS costs a lead person or group should be identified to ensure that costs are not double counted, that is the same cost should not be included on multiple worksheets. This person or group should also ensure that all costs are included within the workbook.

Step 1: Define the community for which costs are being calculated

The first step in calculating EMS system costs from a societal per

costed. These agencies may not directly participate in patient care and may not be what would traditionally be called an agency. For example, a state agency may provide communication equipment or a police department may provide a training facility. These agencies should then be categorized using the types of agencies listed in Table 1. There is a tab in the workbook for each of these agency types. If in the community for which costs are being calculated one of the types of agencies listed does not participate in the EMS system, click on that tab and type “N/A” next to “name of agency” and leave the rest of that worksheet blank. Do not delete the worksheet as this may result in the spread sheet formulas failing to function properly. If the community has an agency type which is not specifically listed in Table 1 pick the type of agency that is closest to it.

Table 1: Types of Agencies that can be used

Agency Type	Naming Convention	Example
Emergency Medical Service (i.e., ground ambulance service)	EMS	EMS1
Police Department Fire Department	PLC	PLC1

6. Click on cell A1 and from the EDIT menu select PASTE.
7. From the VIEW menu select ZOOM and 75%.
8. Click on cell C15 and from the WINDOWS menu select FREEZE_PANES.
9. Right-click on the tab of the new worksheet and select RENAME. Type in "EMS2" (all upper case and no spaces) and hit the return/enter key.

There is now a worksheet for a second EMS agency. To add additional worksheets for other EMS agencies, follow the steps described above, renaming the worksheets sequentially EMS3, EMS4, etc. and place them so that they are always between EMS1 and EMS999. The workbook can only accommodate 999 of any one agency type but it is not anticipated that a community would need more than that. Similarly, to add worksheets for other agency types like police or fire, follow the steps outlined above, but using the naming convention shown in Table 1. The order of tabs for each specific agency type must follow sequentially from left to right: AGENCY1, AGENCY2, AGENCY3, etc., AGENCY999, TOTALAGENCY.

When adding a new worksheet for an agency type, always move the new worksheet in between AGENCY1 and AGENCY999 and rename it with the next sequential number. Never move the AGENCY1, AGENCY999 or TOTALAGENCY worksheets. Never enter data on to the worksheet pages labeled AGENCY999 or TO77y.h Py.h Py.h P-b6Nency

use by EMS should be determined (see Step 3). This percent should be calculated based on the percent of calls sent through the system that are medical (option #1 in step 3). The percent of time on medical calls (option #2 in step 3) is preferred but is probably not feasible to measure.

Specialty Teams/Hazmat

The Hazmat or other specialty teams (like swift water rescue, high angle rescue, trench, confined space) may reside within one of the agencies already listed in the workbook or it may be a separate agency. However, because Hazmat and other specialty activities can be expensive

are provided by the hospital these should be included on the hospital worksheet.

Hospital costs may actually represent a variety of organizations that provide salaries, services, and goods within the hospital. For example, a hospital could provide on-line medical direction via physicians whose salaries are paid for through a practice plan, hospital communication equipment paid for through the hospital budget, and secretarial support and office supplies paid for through a medical school's budget. It is important that all these costs are included. Also account for the time required to notify the emergency department that EMS is bringing a patient to the facility, even when no on-line medical direction is provided.

Medical Direction

Physician, nurse, or other healthcare provider time for direct (on-line) and indirect (e.g., creating protocols, serving on oversight committees, and conducting quality of care reviews) medical direction should be accounted for even if it is provided by individuals who are working in an emergency department while also performing clinical duties, or on a voluntary or uncompensated basis. To calculate the human resource cost for these providers, identify the number of hours worked on this activity, and whether this activity was shared (e.g., also providing clinical care) or dedicated to EMS. If shared, estimate the proportion of time that the worker devotes to EMS (see Step 2). For example, if physicians spend 1 hour of each 12 hour clinical shift providing on-line medical direction to EMS providers, then enter 730 hours in the human resource section for the number of hours worked per year (1 hour per shift times 2 shifts per day times 365 days per year). Then estimate the average hourly wage and benefits for a physician in that emergency department. If residents or other staff participate, their time involved should be determined separately and their regular pay rate used instead of the higher attending physician rate. This could also be calculated by taking the overall number of calls separated by the type of provider who takes the call and then multiplied by the average time on a call and that level of provider's average salary. This information would be included in the Hospital (HSP) worksheet.

If an EMS agency contracts with a local hospital for medical direction, this cost should be accounted for using the hospital worksheet and the contract charges should not be included on the EMS worksheet. However, if it is not possible to complete the hospital worksheet for those costs, then the EMS contract cost should be reported instead. These costs should not be included on both the EMS agency and the hospital worksheets since that would result in an over-estimation of medical direction costs. Further, the contract charges may not represent the true costs. Account for all

medical direction costs even if the contract is less expensive than the true cost.

Medical Directors for an EMS agency participate in a variety of activities. Whether this time is provided as part of their hospital duties, as an employee of the EMS agency, or as a private citizen, these costs must be accounted for. This includes time spent creating protocols, serving on oversight committees, conducting quality reviews, etc. The time spent on these activities as well as use of support staff and equipment should be included on the hospital or EMS agency worksheets. If it is necessary to create a separate worksheet for medical direction it should be labeled as an

Businesses/Universities and other entities that Provide Emergency Medical Care

Businesses, universities, prisons or other entities might have their own internal emergency medical response teams and equipment. These should be considered as the list of potential agencies is developed. However, a worksheet should only be developed for these agencies if they are considered a part of the formal EMS system. A test for this is whether or not their presence changes the resources that are sent to the scene when there is an emergency request for aid. For example, if when a university has a medical emergency their internal EMS providers care for and transport the patient then this should be considered an EMS agency and a worksheet should be created for them and labeled using the EMS agency type naming convention. On the other hand, if a university has responders but they have no duty to respond, are not licensed within the community, and/or are not a recognized part of the EMS system and the local EMS agency would still send the same response to the call as they would if it had come from a local residence then no worksheet should be created for that agency.

Step 3: Estimate the percent of time that each agency is involved in EMS

A given agency might serve several roles within the community that is being costed in addition to the EMS services it might provide (e.g., a fire

TOTALAGENCY worksheet provides the total cost for all agencies of that type using the four percent calculation options listed above and the alter

				provided	provided
Fire	FRE	Option 2	Option 3	User provided	User provided
Air Medical Transport/Other Specialty Transport (e.g., Marine)	AIR	Option 2	Option 3	User provided	User provided
Communication Center	CMC	Option 1	Option 1		

employee type below the label. The existing labels in the green colored cells can be replaced with the names of the agency's employee types. For each type of employee, report the total number of hours worked in a year, the average hourly wage for that position, and the average hourly benefit.

For example: In EMS1, to add costing information for EMTs, click on the cell "Employee 1" (shaded in light green) and type in "EMT". To add additional employee types enter their designations into the Employee Type row, using a separate column for each employee type.

When completing the worksheet for salaried employees who do not have a set schedule assume that a salaried employee works 37.5 hours per week for 48 weeks or 1800 hours per year. Their average hourly wage is their compensation (including performance bonuses) divided by 1800. The average benefits are the employee's total benefits divided by 1800. Although these employees may work many more hours per week, this method will approximate those costs.

If the number of hours a salaried employee works is known, divide the salary and benefits by that number and enter that information on the worksheet. If wages and benefits are not separated from each other, calculate the average hourly wage and benefit, and enter this value in the "wage" cell and leave the benefit cell blank. If employees are paid hourly rather than salaried, include the average wages and benefits for each

renovation. If there were multiple renovations, include all renovations that have been made in the last 15 years. Enter them in separate columns but only enter the building costs once. The workbook will calculate economic and accounting depreciation for building costs and will use 30 years as the as the life span for the buildings and 15 years as the life span for renovations. Thus, buildings and renovations that are older than their life spans of 30 and 15 years respectively, do not contribute towards the agency's cost. These life spans can be changed for the entire workbook by going to the CPICF worksheet and changing the values for the "average life span of the building" and/or "average lifespan of renovations". Alternatively the lifespan for a single building or renovation can be changed by changing the individual values for that specific building. However, once these are changed from the default any future changes will need to be made manually.

When the purchase or renovation costs of a building are unknown, estimate the costs using the cost of the most recently built similar building. If this method of estimation is used, under year the facility was purchased state the year the building that is being used for the cost estimate was purchased. If the building was purchased more than 30 years ago leave the cost of the building blank, but account for any renovations. For a building that is not owned by the agency and there is no lease charged to the agency, estimate a lease cost for that building and enter that cost on the worksheet. This can be done by using the average industrial lease cost for the area.

For a building that is shared, determine the percent of the building that is devoted to the agency by calculating the total square feet devoted to the agency being costed and divide that by the total square feet of the building. If creating a worksheet for an agency that serves multiple functions including EMS, calculate the portion of the building that is devoted to that agency not the proportion that is devoted to EMS. The percent devoted to EMS will be determined using the percent calculated in step 2. If determining the cost of a single service provided by that agency, such as the police bicycle response at a pedestrian mall (see description in step 3), then calculate the percent of the building that is devoted to the EMS-related service, not to the entire police department.

For a rented or leased building, include the rent or lease costs for the year. Use the same guidelines as stated above for partial use arrangements. The worksheet will not allow both a rent or lease cost and a purchase cost to be entered. Lease costs should be reported using the same year stated at the top of the worksheet. This is adjusted to 2006 dollars for the total.

Next determine the actual yearly cost for utilities (e.g., electricity, gas, telephone, cable television service), janitorial services, maintenance, and insurance for the entire building. If there are other costs for the building list them in the worksheet under "other facility costs." If the

agency budget reports a total cost for all of these services that may be entered instead of the individual amounts.

If the building utility costs are only known for the percent of the building that is devoted to the agency then enter those in the rows “utilities attributed to the agency”. If the building utility costs are only known for the entire building then enter those in the rows “utilities attributed to the building” and the workbook will automatically apply the percent listed under percent of this building devoted to this agency. Either method can be used or both methods can be used for different utility types but do not double-count utility costs.

Step 7: Calculate Vehicle Costs

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For each type of consumable equipment or each category of consumable equipment list how many units are used or discarded per year, and the average cost per unit. If there are large categories of purchases from an agency budget and the number of units is not available leave that section blank and enter the total cost for the category in the row labeled "total cost per category".

Step 9: Calculate Other Administrative Costs

Shared or Contracted Services

Identify and include on the worksheet any services the agency uses that have not been counted in the previous steps. This includes services such as: human resources management by an outside agency, information technology services, legal services, or laundry service. Only list those that are not included in the previous steps.

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entry determine if it is licensed or purchased. If it is licensed, enter the annual licensing fee. If it is purchased, enter the total purchase price and the anticipated life span in years. In either case, enter the number purchased or leased and any training fees that are not included in the purchase price or accounted for elsewhere.

course during the year, the average number of hours the course lasts, and average additional costs of the course (e.g., room rental, refreshments, etc.). For agencies, that are not included in the workbook it may be necessary to estimate the total number of trainees and the training costs.

Enter the prevailing wage for the community at the top of the worksheet (see step 5).

Estimate the number of public access defibrillators available in the community for which costs are being calculated. Place this number on the worksheet. Also, estimate the average cost of an automated external defibrillator in the community. For example, use a community or state negotiated cost for AED's. Eight years is suggested for use as the average life span, unless there is a community specific lifespan.

On each agency worksheet