

User Manual for NMDOH HSI Model

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Introduction

This model was originally developed as part of the New Mexico Department of Health State Innovation Model Health System Innovation Project. It has been altered into a highly flexible and user-friendly model that can be used to support the continuation of the HSI and help to demonstrate the financial sustainability of the HSI programs or other programs developed by HSI and the stakeholders.

This model estimates return on investment (ROI), cases avoided (CA), changes in health care spending, and changes in health care system access/capacity. While the model was designed to be user friendly, it still requires a fair amount of effort to get it up and running.

This model is based entirely in Excel™ and therefore is completely transparent; any calculation can be followed through the workbook fairly easily. Most assumptions are made by the user (that's you) and any assumption not made by the user is explained in the User Manual.

The work required to use this model is almost entirely in the gathering of data, information, and literature. The better the inputs, the better the output. Spend time familiarizing yourself with the model, but also spend time thinking about your own project and how the model might help you.

There are two basic uses for the model:

- 1) Offense: during the development of a new program when the user desires ROI, CA, savings/costs, or access/capacity change estimates.
- 2) Defense: in a situation when the user is given information about a proposed program, for example by an insurance company, and the user wishes to verify the results before making a decision whether or not to adopt that program.

The workbook contains 14 worksheets. They are listed below along with some basic information about each sheet (see User Manual for details):

- 1) Chart Net Savings: Displays net savings, both annual and cumulative as a bar chart

- 2) Chart Cases Avoided: Displays cases avoided, both annual and cumulative as a bar chart
- 3) Chart Program Costs: Displays program costs, both by program as a bar chart, and total annual costs as a line graph at the top of the bar chart.
- 4) Chart ROI: Displays average ROI, as a bar chart.
- 5) Front End: This is the user interface. From this sheet, the user can select subgroups, the discount rate, the costing type, etc. and view the inputs and results of the model.
- 6) READ ME: You are currently on the READ ME page.
- 7) Program Effects: The user inputs the program effects on this sheet.
- 8) Program Costs: The user inputs the program effects on this sheet.
- 9) Health Care Data: The user inputs data about health care costs, number of beneficiaries, and other health care related data on this sheet.
- 10) Programs Strata Outreach: The user inputs information about the programs to be analyzed, the subgroups (strata), and the program outreach on this page.
- 11) Lookup: This sheet creates a code that used to identify the population of interest selected on sheet "Front End." This sheet is not designed to be altered by the user.
- 12) Lookup Codes: This sheet creates all of the lookup codes which are used by the model. This sheet is not designed to be altered by the user.
- 13) Text for Data: This sheet generates the descriptions of the groups based on user input on "Programs Strata Outreach" which are displayed on "Health Care Data." This sheet is not designed to be altered by the user.
- 14) Calculations: This sheet contains all of the calculations done by the model after the user input is complete. While this sheet is not intended to be altered by the user, it can be, and could be altered to support different assumptions or modeling goals.

After going through the model workbook sheet by sheet, an example program will be analyzed. The sample program section contains the sample program results. You can always check the integrity of your "BLANK" workbook by entering all of the sample program information and comparing your results to the screenshots in the sample program section.

Let's get started!

Getting Started

- Please open, "UNM Econ NMDOH Model BLANK.xlsx"
- Please "Save As" immediately.
- Keep the file, "UNM Econ NMDOH Model BLANK.xlsx" as your template and do not alter it.
- If you ever need a "fresh" copy of the template, please email David N. van der Goes, PhD: dvandergoes@unm.edu.

The Excel™ spreadsheet should open to the “READ ME” page which contains most of the introduction that you just read.

If you have not already done so, please “Save As” and keep the template unaltered for later use.

This model was originally designed to analyze chronic conditions over a ten-year timeframe. While the model can be used for other purposes, the user should be careful in the setup and assumptions when trying to analyze acute conditions. The timeframe will be modified by the user but the *maximum* number of time periods is ten.

Step One: Go to “Programs Strata Outreach” Worksheet

Health Areas	Stratum 0	Stratum 1	Stratum 2	Stratum 3	Programs	Outreach	Time	Yes/No	Discount Rate
Group All	off	off	off	off	Group All	0%	1	Yes	0%
Health Area Group 1	off	off	off	off	Program 1	0%	2	No	1%
Health Area Group 2	off	off	off	off	Program 2	0%	3		2%
Health Area Group 3	off	off	off		Program 3	0%	4		3%
Health Area Group 4	off	off				0%	5		4%
	off					0%	6		5%
						0%	7		6%
						0%	8		7%
						0%	9		8%
						0%	10		9%
									10%

Figure 1: Programs Strata Outreach

Figure 1 displays the first page that will require user input. There are several rules that *must* be followed on this page for the model operate correctly:

- 1) Health Areas: under the bold header the user can define up to four (the fifth group must be all groups combined) different health areas of interest.
 - a. The word “group” may not be in the name.
 - b. If you want to use the “All” setting you must remove the word “Group” from that cell (B3) – and you should use the “All” setting even if you only have one health area to analyze.
- 2) Stratum 0-Stratum 3: The bold header name must be changed and cannot contain the word “Stratum” if you wish to activate that column.
 - a. It is highly recommended that you rename the header with something meaningful and easy to understand and remember.
 - b. You must use Stratum 0 first followed by Stratum 1, Stratum 2, and Stratum 3 last. Even if you only wish to use three categories in Stratum 0, you will use Stratum 0 first.

- c. Do not change the name of bold header for a stratum you are not using.
 - d. Planning is important. The most categories for any single strata is six. The maximum number of subgroups is 360.
 - e. “off”: Under each Stratum header that you renamed, rename the categories from “off” to any name that does include “off” – even as part of a word, like “Davidoff” or “offense.” Again, when naming categories, it is highly recommended that you rename the header with something meaningful and easy to understand and remember.
- 3) Programs: The model is capable of producing results for up to three individual programs and/or three programs simultaneously. It cannot analyze combinations of two out of three programs. *If this is necessary, the user can remove a program and use the results generated by the model with the two remaining programs.*
- a. Remove the word “Group” from the top of the program list to activate the ability to analyze all programs simultaneously.
 - b. Programs 1 and 2:
 - i. These are “general” programs. The original design included a health information exchange and patient-centered medical homes, so think about those types of programs when you think about programs 1 and 2.
 - c. Program 3:
 - i. This is a worker based, targeted population program. The original design included a community health worker program that focused on the top 2 percent of health care utilizers, so think about that type of program when you think about program 3. Name the program with something meaningful and easy to understand and remember.
- 4) Outreach: Outreach does not need to be renamed but it can be. The percentages below the bold header must contain positive numbers for your program to have any effect or impact. All three programs are assumed to have the same outreach. The outreach percentage changes the number of beneficiaries/patients/enrollees who are impacted by the programs; it does change the cost of the programs, i.e. the entire program is paid for even when only a fraction of the beneficiaries is reached.
- 5) Time: Time can be renamed to whatever unit of time you wish to analyze but keep in mind you only have ten time periods in the model. The original model used years but quarters or months may also be reasonable units depending on the user’s goals.
- 6) **Yes/No: Do not change or edit.**
- 7) **Discount Rate: Do not change or edit. The discount rate determines how future costs, savings, cases, etc. are valued. The higher the discount rate the less you value the future. This setting is changed on “Front End.”**

At this point you can fill in the names for the strata you wish to use, name the subgroups/categories within each strata, and input the outreach. When you have completed this page please move to “Health Care Data”

Step Two: Health Care Data

The next step in the process of analyzing a program is to enter the data about cost and the size of the group being analyzed.

- 7) Target Group Cost: This is the targeted group cost. This is only used for Program 3. In the original model the 98 percentile costs were entered here. This number will depend on your target population and the design of Program 3. If you are not using Program 3, this column can be left blank.
- 8) DATA: This is a YES/no column. This is a very helpful column to the user. After you fill out the information on “Programs Strata Outreach” the DATA column will show a yellow highlighted “YES” only for the rows of uniquely defined subgroups. For example, if you choose two health areas, three categories for Stratum 0, and two categories for Stratum 1, there will be exactly 12 highlighted “YES” cells on “Health Care Data.” The user only needs to input data into those rows.

After you have filled Population, Average HC Cost and the rows of data indicated in the DATA column, you can move on to the next page, “Program Costs.”

Step Three: Program Costs

At this stage you will need to know the costs of your programs and input them into the sheet in the light blue cells.

Program Costs (nominal)										
	Time	P1 cost 1	P1 cost 2	Program 1	P2 cost 1	P2 cost 2	Program 2	P3 worker	Program 3	Total
	1			\$ -			\$ -	\$ -	\$ -	\$ -
	2			\$ -			\$ -	\$ -	\$ -	\$ -
	3			\$ -			\$ -	\$ -	\$ -	\$ -
	4			\$ -			\$ -	\$ -	\$ -	\$ -
	5			\$ -			\$ -	\$ -	\$ -	\$ -
	6			\$ -			\$ -	\$ -	\$ -	\$ -
	7			\$ -			\$ -	\$ -	\$ -	\$ -
	8			\$ -			\$ -	\$ -	\$ -	\$ -
	9			\$ -			\$ -	\$ -	\$ -	\$ -
	10			\$ -			\$ -	\$ -	\$ -	\$ -

Figure 3: Program Costs for Programs 1 & 2

Figure 3 shows where to enter cost data for Programs 1 and 2. Under “P1 cost 1” the user enters the first cost component of Program 1. The program can have different costs in each time period. Also, each program has two cost columns. It is only necessary to use one of the columns and the model is indifferent to which column that is used. There are only two columns to make it slightly easier on the user – if there are more than one type of costs or to easily add costs later.

Note that you should enter these costs in “today’s” dollars. The sheet will automatically convert nominal dollars into real dollars. Each program has two columns for costs; if nothing is entered in either light blue cost column for a program then that program is “free.” The program names

you assigned on “Programs Strata Outreach” will appear on this page to help reduce the possibility of assigning the wrong costs to the wrong program or assigning no costs to a program you wish analyze.

Program 3	Base Salary	Fringe	Overhead	Total
Worker Cost	\$ -	\$ -	\$ -	\$ -
Fringe Rate	0%			
Overhead Rate	0%			
Program 3: Percentage	0.00%			
Program 3: hours/patient	0			

Figure 4: Program Costs for Program 3

Figure 3 shows the cells where the costs for Program 3 are entered. There are five cells that must be filled in for Program 3 to be analyzed correctly:

- 1) Worker Cost: Enter the base annual salary for the type of worker that is used in Program 3. Here is an excellent place to start: http://www.bls.gov/oes/current/oes_nat.htm.
- 2) Fringe Rate: Enter the percentage of the Base Salary that is paid out in fringe benefits; this is in addition to the base.
- 3) Overhead: Enter the percentage of Base Salary plus Fringe that is required for the job; this is in addition to the base and fringe.
- 4) Program 3: Percentage: This is the percentage of the people in the health area to whom the worker will be assigned. This is user-defined and based on the program design and goals. In the original model this was the top 2 percent of spenders in a group and the number was set at 2.00%. If this number is left as zero, the program will have no costs because the workers will not have any people to help.
- 5) Program 3: hours/patient: This assigns a number of hours for the worker to work with or help the assigned patients per year. This is user-defined and based on the program design and goals. If this number is left as zero, the program will have no costs because the workers will work zero hours.

Note 1: Workers are assumed to work 2,000 hours per year.

Note 2: Program 3 costs are worker based. If Worker Cost, Percentage, or hours/patient are blank or zero, Program 3 has no costs.

Note 3: Program 3 assumes workers can be hired at exactly the number required. This happens based on the size of the group, the percentage of the group assigned to workers and the number of hours per patient. For example, if a group of 4,000 people has 3 percent assigned to workers for 10 hours per patient that totals 1,200 hours. Out of a 2,000-hour year that is 0.6 workers required by the group. The model assumes that 0.6 workers can and will be hired.

Note 3: Program 3 is a special type of program and should carefully thought through before using.

After the user has filled in the program cost cells on “Program Costs” the user can move on the sheet, “Program Effects.”

Step Four: Program Effects

Each of the three programs can have three types of effects (see Figure 5):

Health Area Group 1		1.00									
		Program 1	Program 1	Program 1	Program 2	Program 2	Program 2	Program 3	Program 3	Program 3	
	Time	Savings	Health	Access	Savings	Health	Access	Savings	Health	Access	Outreach
	1										0.00%
	2										0.00%
	3										0.00%
	4										0.00%
	5										0.00%
	6										0.00%
	7										0.00%
	8										0.00%
	9										0.00%
	10										0.00%

Figure 5: Program Effects

- 1) Savings Effect: this is the gain in efficiency from any reduction in unnecessary emergency department (ED) use or admissions, medication errors, diagnostic duplication, and the like. The savings effect should not include any changes from improved health status, as when a pre-diabetes diagnosis does not progress to one of diabetes.
- 2) Health Effect: gains from changing health outcomes, i.e. improved case management, slowed progression of disease, case avoidance (helping someone quit smoking to avoid lung cancer).
- 3) Access (capacity) Effect: A change in access to the system or a change in capacity of the system... This effect...

Program effects can vary for each time period, for each effect type, for each program. Also, the effects must be entered for each health area. The user potentially needs 360 effects for the model to analyze four health areas with three programs each and three effects for each program. This is the most time intensive part of getting the model to produce high quality results.

At this point, the user can go to the “Front End” and start looking at results of the analysis.