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## How Using a Logic Model Refined Our Program to Ensure Success

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What is This?

# How Using a Logic Model Refined Our Program to Ensure Success

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*When a program does not produce expected changes in the outcomes of interest, program staff must understand why before making programmatic decisions. One mechanism for doing so is the logic model. This article describes how using one such logic model (the ATM approach) was used to improve areas of program planning and implementation. The key components include interviewing stakeholders to identify antecedent conditions to the problem of interest that are placed in a summary map and then prioritizing those conditions to address with program activities. Although the logic modeling process was helpful in making programmatic improvements, there were also several unintended benefits of engaging in the process including: providing a framework for planning and evaluation, helping the program operate more effectively and efficiently, and providing a common language among program staff and the evaluators.*

***Keywords:*** *logic models; health careers; program planning*

The Southern Arizona Border Health Careers Opportunity Program (SABHCOP) was one of 42 of the Bureau of Health Professions programs funded by the Health Resources and Services Administration (HRSA) to address the shortage of health care professionals choosing to practice in rural and underserved areas. As evidenced by the Office and Management and Budget's (OMB) assessment, these programs have failed to demonstrate effectiveness (ExpectMore.gov, 2006; Huntington & Renger, 2003; "Program Performance Assessments,"

2002). As a result, OMB recommended the termination of funding for these programs. In response to OMB's recommendation, HRSA endorsed the use of logic models as a method to improve accountability (Advisory Committee on Interdisciplinary Community-Based Linkages, 2004, 2005).

Logic models provide a systematic process for allowing key elements of program planning, development, implementation, and evaluation to be logically connected (Alter & Murty, 1997). After 3 years of a 5-year grant, SABHCOP program staff recognized that the program activities were not effectively meeting the program's goal of increasing students' entry into health professions programs based on feedback provided on evaluation forms by students and staff attending program activities. In an effort to improve programming and in response to the HRSA endorsement, SABHCOP program staff engaged in a logic modeling process to determine how to improve the planning, implementation, and evaluation of existing program activities.

This article describes the process of using a logic model (the ATM approach) to identify and redefine program activities and also highlights several unintended benefits of engaging in the logic modeling process. A description of the logic modeling approach is first outlined followed by an example of how our program was changed as a result of engaging in this process.

## ▶ THE ATM APPROACH

Our program used the ATM approach to logic modeling (Renger & Bourdeau, 2004; Renger & Titcomb,

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2002). The ATM approach is a three-step process designed to engage stakeholders in the development of a logic or conceptual model for their program. The ATM approach was preferred over other logic modeling approaches because it can be applied both to the development of new programs and to existing programs.

The first step in the ATM approach is A: Antecedent conditions. The goal of this step is to develop a visual map of the "problem" and its relationship to other antecedent conditions or root causes. The problem that our program attempted to address is why high school youth were not enrolling in health career professions.

The ATM approach begins by interviewing content experts to help understand the problem and its associated antecedent conditions. This is simply accomplished by asking content experts a series of "Why?" questions. As a result, a visual map is created that depicts the relationship between the problem and its associated antecedent conditions.

Figure 1 is an example of an evolving visual map as a result of the interview process. The map can be read by using a series of if-then statements. For example, if there is a lack of materials about a variety of health careers (one antecedent condition), then individuals may not be aware of careers other than doctor, nurse, and pharmacist (another antecedent condition), which results in students not enrolling in health professions programs. At the end of the interview, the stakeholder is questioned as to which of the antecedent conditions identified during the interview is the most important for addressing the problem. A second condition is also identified. These conditions are circled on the individual map and compared with other stakeholders.

Once all stakeholder interviews have been completed, each individual logic map is merged into a single summary map. A review of the research literature is then completed to determine the extent to which linkages identified by experts can be supported. It is the combination of expert opinion and research support that creates an evidence-based foundation from which to proceed to the second step.

The second step is T: Target antecedent conditions. As a result of Step 1, numerous antecedent conditions are uncovered, often too many for any one agency or program to target. Therefore, the purpose of Step 2 is to achieve clarity as to which of the antecedent conditions identified in Step 1 will be targeted by activities developed to address the problem. The process by which antecedent conditions are discovered and targeted is similar to that suggested by other authors for determining the importance of targeting antecedent conditions for change—that is, for identifying which conditions are sensitive to attempts to intervene (Green & Kreuter, 1999; W. K. Kellogg Foundation, 2001; Renger & Hurley, 2006). Although the ATM model helps determine what to target, it is not prescriptive in how to target the most important conditions; rather, it leaves intervention methodology to program personnel.

Again, in this second step, the expertise of the stakeholders is key. Those who have experience with the problem are in the best position to know which conditions are most important to be targeted. Stakeholders provide the insights into which of the antecedent conditions are of the most importance for change. This prioritization focuses the scope of the activities needed to address the problem.

Once antecedent conditions have been prioritized, strategy development can begin. Central to developing strategies is to write detailed protocols that ensure that the rationale describing how the proposed activities/strategies actually target the prioritized antecedent conditions is made explicit. A detailed protocol also provides the goal and objectives. These protocols allow for fidelity in implementing the activities. In essence, the protocols prevent programs from engaging in activity traps (Renger & Titcomb, 2002). Activity traps are activities that on the surface seem worthwhile, but on closer inspection, do not address any of the prioritized antecedent conditions.

The final step is M: Measurement. In this step, potential indicators and objectives are noted for each antecedent condition targeted by program activities.

### Application of the ATM Approach

Based on the ATM process described by Renger and Titcomb (2002), the program staff implemented the
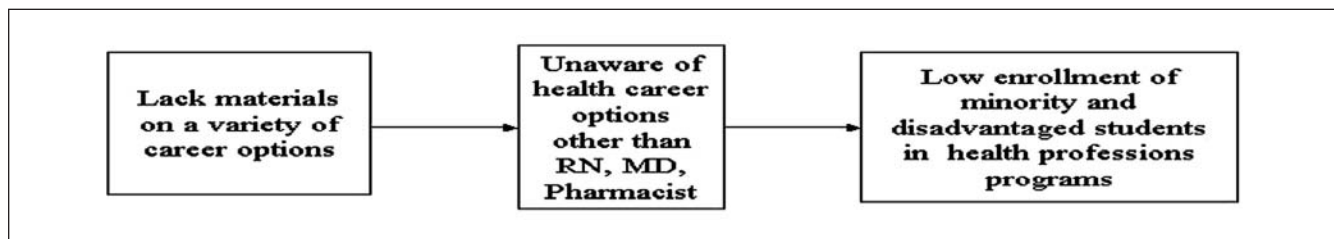
**FIGURE 1    Relationship of Antecedent Conditions to Problem**

logic model process. Four staff members conducted 20 stakeholder interviews during 3 to 4 weeks to determine key antecedent conditions affecting students' entry into health professions. Each interview lasted approximately 45 minutes and followed the approach outlined in Step 1 of the ATM. The evaluation team compiled the results of the interviews and merged the antecedent conditions into a single, summary logic model map (see Figure 2).

Staff members reviewed the summary map and conducted a literature review of each antecedent condition to determine its existence and relevance to the problem. The literature review, although potentially time-consuming (3 to 4 weeks depending on the number of conditions and the number of staff members researching) provides the theory and justification for moving to the next step. Without sufficient evidence that the antecedent condition exists in the field and has been addressed by other programs, the agency may not have the resources necessary to address the condition. If the condition is unsubstantiated, it is removed from the map.

In our process, a total of 44 antecedent conditions were identified, far too many for our resource-limited program to target. Therefore, SABHCOP staff and the evaluation team engaged in the prioritization process (Step 2) whereby antecedent conditions were prioritized by importance and changeability during the grant period. The logic for using prioritization criteria is shown in Table 1. Each antecedent is placed in the quadrant resulting in the greatest fit. Antecedents in quadrant 1 match the program goals and are retained. Antecedents that fall in quadrant 4 are immediately eliminated from the program because of the lack of fit. Finally, antecedents that fall into quadrants 2 or 3 must be weighed as to the goals and directives of the program and/or the funding agency and the amount of resources available to allocate to the antecedent condition. As a result of the prioritization, 11 conditions were eliminated.

After the prioritization, existing activities were thoroughly examined to determine whether elements of the activities could be logically linked to the 33 remaining prioritized antecedent conditions (e.g., 15 are shown in Table 2). The program curriculum specialist, the program staff, and the evaluators completed this process during the course of several hours by analyzing each of the four existing activities from start to finish for the 33 antecedent conditions.

On reviewing the antecedent conditions, it was evident that several of the antecedent conditions could be theoretically grouped together and addressed as a unit in presentation or in curriculum content. For example, using the grouping title of "perceptions," these four statements could be addressed together—perception that all health careers deal with sick people in hospitals, that all health careers are stressful and depressing, that all health professionals have to deal with death of patients, and that all health professionals work in a busy or hectic environments.

In addition, from Table 2, it can be seen that there were four antecedent conditions not targeted by any of the current activities (see items 9, 10, 12, and 14). Given this finding, there were two options for making program improvements. The first option was to rewrite or modify one of the existing activities to address the prioritized antecedent condition(s). If this is not possible, then the second option is to develop new activities to address the prioritized antecedent conditions. To illustrate, we will highlight one of the modules we choose to rewrite in the Results section.

## ▶ RESULTS

We chose Option 1 because the structure of existing activities lent themselves well to simple modifications. Activities were thoughtfully designed to address these prioritized antecedent conditions identified as barriers to entry into health careers. For example, one activity was a guest speaker series. When guest speakers were previously invited to speak, they basically determined the key content of their address given a specified topic by the program. Under the revised plan, speakers were
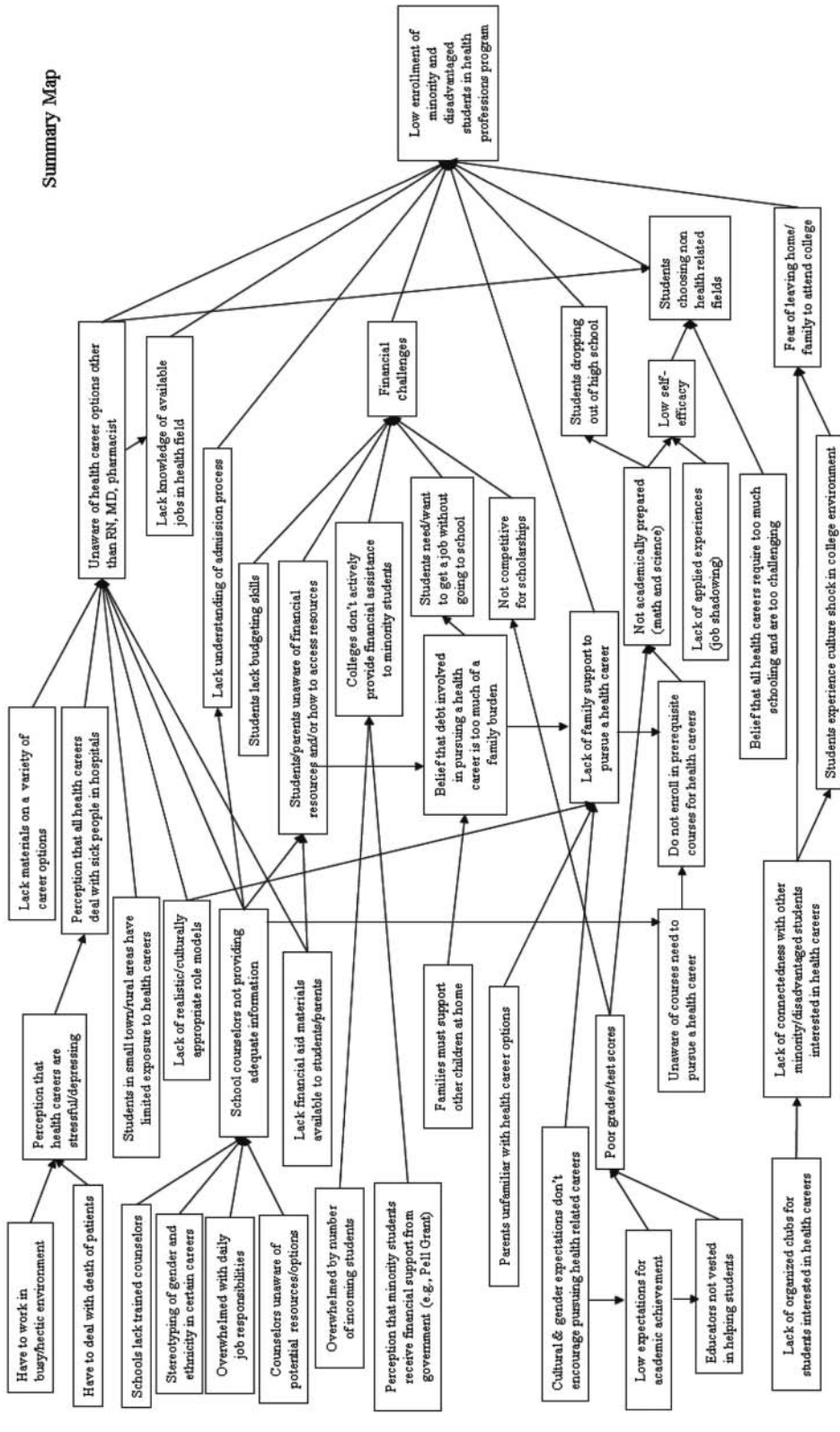
**FIGURE 2   Summary Logic Model Map**

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**TABLE 1**
**Basis for Prioritizing Antecedent Conditions**

|  | More Important | Less Important |
|---|---|---|
| More changeable | High priority for program focus (quadrant 1) | Low priority except to demonstrate change for political purposes (quadrant 3) |
| Less changeable | Priority for innovative program; evaluation crucial (quadrant 2) | No program (quadrant 4) |

SOURCE: Green and Kreuter (1999). *Health promotion planning: An educational and ecological approach* (3rd ed.). Mountain View, CA: Mayfield. Reprinted with permission of The McGraw-Hill Companies.

**TABLE 2**
**Antecedent Conditions Linked to Activities and Prioritized—Enrollment**

| Antecedent Condition | High School Health-Career Clubs | Culture and Leadership Retreat | Saturday Academies | Middle School Program | Prioritized |
|---|---|---|---|---|---|
| 1. Lack knowledge of available jobs in health field | X | X | X | X | X |
| 2. Unaware of health career options other than RN, MD, or pharmacist | X | X | X | X | X |
| 3. Perception that all health careers deal with sick people in hospitals | X | X | X |  | X |
| 4. Perception that health careers are stressful and depressing | X | X | X |  | X |
| 5. Have to deal with death of patients | X | X | X |  | X |
| 6. Have to work in a busy/hectic environment | X | X | X |  | X |
| 7. Students in small towns/rural areas have limited exposure to health careers | X | X | X |  | X |
| 8. Lack of realistic/culturally appropriate role models | X | X | X |  | X |
| 9. School counselors not providing adequate information (health career options or financial aid) |  |  |  |  | X |
| 10. Counselors unaware of potential financial resources or career options |  |  |  |  | X |
| 11. Students lack understanding of admission process |  |  | X |  | X |
| 12. Financial challenges |  |  |  |  | X |
| 13. Students/parents unaware of financial resources and/or how to access resources |  |  | X |  | X |
| 14. Health career fairs/college fairs lack financial aid materials |  |  |  |  | X |
| 15. Students not competitive for scholarships | X |  | X |  | X |

asked to discuss within their talk some ideas relating to the prioritized antecedent conditions: namely, misperceptions about health careers, educational requirements, workplace environments, and so forth (i.e., Step 1 of the ATM approach).

To improve the guest speaker activity, written detailed protocols were modified to provide an outline and instruction of the methods detailing the timing of each activity, the resources needed, and key information about implementing the lesson (i.e., Step 2 of the ATM approach). The written protocols provide a benefit to the evaluator as well as to the speaker and program staff to ensure that the activity is implemented as outlined. The evaluator bases the process and outcome measures on the indicators outlined in the protocol designed for the activity.

Furthermore, the staff established the guidelines for inviting a guest speaker. Invitations to speak were decided from the speaker's ability and knowledge about the content and their delivery and interaction style being conducive to engaging high school students. Program staff implemented a policy of viewing the speaker's presentation style before contacting him or her to speak at a planned activity. Once the speaker was invited, a staff member met with the speaker to review the proposed outline of the overall activity, the specific content to be presented, the target audience, and suggested methods to present the content in addition to the traditional lecture. This ensured a better match for speaker-audience dynamics. This simple change brought improved success for the implementation of the activity, the satisfaction of the program staff that the activity delivered the necessary information, and the change in the participant through increased knowledge or skill building, and enjoyment of the speaker as measured from the speaker-activity evaluation form that asked participants to rate the speaker for meeting the stated objectives, overall content, practicality or application of the material, and suggestions for improvement.

How the prioritized conditions were used to better focus our activities was then documented. Previously, our program documentation lacked the necessary detail for replication. Now each existing activity includes key information described from the logic model process, including the goal(s), objectives, antecedent conditions addressed, and an explanation or rationale of how the activity addresses the antecedent condition(s). This change resulted in improved and detailed "implementation protocols" outlining the explanations about the purpose, implementation of the activity, methods, time allocated, necessary resources, and evaluation components, if required.

Another example of our rewriting of program activities was the culture and leadership retreat held during the summer for high school juniors and seniors. The week-long intensive retreat comprised of many activities (both small and large group) required the staff to engage in identifying targeted antecedent conditions and providing a rationale as to how each specific activity led to an expected change in the participants. The appendix shows an example of one of the activities, including the goals, objectives, antecedent conditions, rationale, and methods for implementing. A traditional pre- and posttest given to the students found significant changes in $t$ test scores for 50% of the questions in the students' attitudes and skills regarding cultural beliefs, communications, and the importance of cultural sensitivity in health care professionals. Several additional questions approached significance, although the remaining questions had relatively higher pretest scores, resulting in a nonsignificant shift by the end of the program.

▶ **CONCLUSION**

Although the decision to engage in the 3- to 4-month process of the ATM logic model approach seemed ominous at the start, the benefits for our participants and the improved outcomes made the effort worthwhile. Developing the logic model and prioritizing are perhaps the easiest and quickest aspects of the process. The literature review and the revising of the curriculum to identify the antecedent conditions and the rationale for change within an activity consumed the most staff time. Once the detailed protocols for each activity were developed, the evaluator easily gathered the necessary data to indicate a change for the participants.

In conclusion, many agencies or programs implement sophisticated activities for students without knowing the background or the underlying antecedent conditions. SABHCOP discovered the use of a logic model to be extremely insightful and helpful for working and operating efficiently and effectively and for framing the structure by which activities are created and implemented. After the critical time spent identifying the antecedent conditions that contribute to the outcome, the entire staff used this framework for thinking through all planning and implementing activities by referring to the logic model and defining the rationale of how an activity targets a condition. The use of the logic model became a second language within the organization, allowing for effective communication among program staff and the evaluator.

It is our experience, as well as our recommendation, that use of the logic model process clarifies the creation

of activities by allowing developers to address underlying antecedent conditions by creating meaningful and intentional activities designed to promote change. This process works best when implemented from the inception of the program idea through the completion of the final outcome measures. However, the ATM approach allows program staff to engage in the logic modeling process in the middle of program implementation to complete the three steps and make modifications as needed. Following the step-by-step process ensures that a problem or outcome is explored in depth through a partnership with stakeholders and participants to determine which areas of the problem can be addressed based on theory, literature, and available resources. Use of logic models allows program implementers to assess the prioritization of antecedent conditions. This prioritization progresses into an opportunity to evaluate existing activities to determine any changes or additions to strengthen activities aimed at reducing a problem. Evaluation of activities from the detailed protocols during their implementation maximizes resources and benefits the staff and participants by making necessary changes during the implementation phase rather than waiting to make changes or to realize program ineffectiveness at the end of the year or grant cycle. In sum, logic models produce a visual map highlighting the areas of importance to the participants. Activities addressing these conditions are more likely to impact the desired change in the participants and to ensure success of the program through targeting and maximizing resources, thus furthering the accountability of the program to the funding agency and the community.

## APPENDIX

Activity: *Remember the Titans*
Type: Video and large group discussion
Goal: To emphasize the importance of teamwork

Key objectives:
- To realize the harmful effects of stereotyping and prejudice
- To realize that teamwork results in a win-win for everyone
- To view how other students learned to look past their differences and to accept one another

Antecedent conditions addressed:
- Fear of leaving home/family to attend college
- Students experience culture shock in college environment
- Lack of connectedness with other minority/disadvantaged students interested in health careers

Rationale:
- Students will view how individuals must leave their comfort zone and be forced into an uncomfortable situation that in the end, makes them stronger from the experience
- Students will identify with the feelings exhibited by the characters and know that they will overcome the challenges of learning to understand another's culture
- Students will identify with the characters in the movie and will feel compelled to create unity with the other delegates at the retreat

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