An Interactive Modeling Tool for Projecting the Health and Cost Impact of Changes in the Sexually Transmitted Diseases Prevention Program Budgets

Appendix 1: Focus Group and Usability Evaluation Data Collection

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Contents:

1. Guided exercise that all focus group participants completed prior to the session
2. Focus group guide for public health professionals from state health departments
3. Focus group guide for public health professionals from local health departments
4. Exercise that usability evaluation participants completed during the live session

Note: We developed SPACE Monkey 2.0 in parallel with STIC Figure 2.0, another cost modeling tool for STI programs. STIC Figure 2.0 is a separate standalone Excel-based model that is not described in our manuscript. Considering both models at once in the focus groups and usability testing, including explicitly asking users to compare-and-contrast the two models, provided a more comprehensive understanding of model users' technical skills, requirements, and user experiences.

1. Guided Exercise for Focus Group Participants

Background and Instructions

What are the STIC Figure and SPACE Monkey tools? These interactive Excel cost modeling tools enable state and local STD programs to: 1) estimate the medical and indirect productivity costs saved from treating diagnosed cases of chlamydia, gonorrhea, and syphilis (*STIC Figure*), and 2) estimate the potential effects of increases or decreases in a jurisdiction's STD prevention funding on future cases of STDs and their direct medical costs (*SPACE Monkey*).

What is the purpose of this project? We are updating STIC Figure and SPACE Monkey to incorporate new data and make them more user-friendly. Ultimately, we want them to be more accessible and relevant for the current information needs of state and local STD directors. To do that, we're asking you to help us understand what works - and what doesn't - about these tools in their current form.

What is my role in providing feedback? We anticipate that our state and local stakeholders have varying awareness, familiarity, and past experiences with these tools, ranging from "have not heard of these tools" to "have used them extensively." To get everyone on the same page, we're asking you to do two short exercises to become familiar with the tools, identify ways to improve them, and brainstorm how you might like to use them in the future. Then, we will ask you to participate in an interactive feedback session with other stakeholders to and explore common themes and differences in stakeholders' experiences.

What do the exercises entail? First, you will use the STIC Figure tool to determine the direct medical and indirect productivity costs saved by treating chlamydia, gonorrhea, and syphilis on Mars. Next, you will use the SPACE Monkey tool to determine how a budget decrease to Neptune's STD program might affect the number of STD cases and associated medical costs over the next ten years. The guided exercises will ask you to enter specific values and reflect on the model results and your experiences. *There are no wrong answers!* Everyone has a different perspective, and we are hoping to hear diverse feedback.

How long will this take? We anticipate this will take 1-2 hours. It is okay to leave some of the comment fields blank.

What are your next steps? After completing this exercise, please send it to Bahareh Ansari (bansari@albany.edu). There are no wrong answers, and you can skip questions or elaborate on items that are most relevant to your experience. We will schedule a time for your live interactive stakeholder feedback session where you will join one or two other STD program

experts. In our live conversations, we will discuss your experiences with the exercise to guide our conversation about how we can enhance these tools.

Exercise 1: Use the STIC Figure tool to determine the direct and indirect costs saved by treating syphilis, chlamydia, and gonorrhea on Mars

Step 1: Open the attached STIC Figure spreadsheet.

- Select "Enable Macros" if prompted.

Step 2: Enter values in screens 1-5. On screen 1, click the "Click to begin" button and continue through screen 5 entering the following inputs into the white boxes.

- Start date: 1/1/2018
- End date: 12/31/2018
- Number of laboratory-confirmed cases treated
    - Chlamydia: 18,000 Women, 11,000 Men
    - Gonorrhea: 4,000 Women, 5,000 Men
    - P&S syphilis: 25 Women, 300 Men
- Treatment of partners
    - Chlamydia: 5,400 Women treated, 3,300 Men treated
    - Gonorrhea: 1,200 Women treated, 1,500 Men treated
    - P&S syphilis: 12 Women treated, 150 Men treated
- Number of people receiving HIV counseling and testing
    - 4,025 Women, 5300 Men

Note: If you want to use your own program data to make this exercise more realistic, you are encouraged to do so. If you do use your own data, be sure to note that in the comments below.

Step 3: Reflect on your experience entering values in screens 1-5: In the box below, list the thoughts/questions that occurred to you when entering the inputs. For example, was there anything confusing about the input process? What usability problems did you encounter?

Comments on the process of entering input values (screens 1 through 5):
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Step 4: Review the limitations and results on screens 6-7. On screen 5, click to continue. Read the limitations on screen 6 and click the box to show results. Review the results on screen 7. In the box below, share your thoughts about the results. For example, are the limitations clear? Is it easy to interpret the results? Are the results presented in a format that is useful for your information needs? Do you have any other thoughts about screens 6 and 7?

Comments on the limitation and results (screens 6 and 7):

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Step 5: Explore the advanced options on screens 8 and A1-A6. Review the calculations and assumptions. In the box below, share your thoughts about the advanced options. Are these the most important assumptions that you would want to tailor for your information needs? Are the "automatic estimates" reasonable baseline assumptions? Are these user-defined options easy to understand and revise?

Comments on the advanced options (screens 8 and A1-A6):

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Step 6: Reflect on how you could use this tool for your own jurisdiction. Please think about how you could use this tool in your own work. What are specific ways that you could use this tool in your own work?

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Do you have any suggestions for enhancing the tool to make it more useful for your current and future information needs?

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If you did NOT use your own program data to fill out the tool, how much effort do you think it would take to locate the inputs? Are there any inputs that are particularly difficult or impossible to obtain for your jurisdiction?

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Do you have any other feedback about STIC Figure that was not covered above?

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Exercise 2: Use the SPACE Monkey tool to determine how a budget decrease to Neptune's STD program might affect the number of STD cases and associated medical costs over the next ten years.

Step 1: Open the attached SPACE Monkey spreadsheet.

- Select "Enable Macros" if prompted.

Step 2: Enter values in pages 1-5. On page 1, click the "Click to begin" button and continue through page 5 entering the following inputs into the white boxes.

- Size of population served by STI programs (all ages): 5,700,000
- Reported number of chlamydia cases: 29,000
- Reported number of gonorrhea cases: 9,000
- Reported number of syphilis cases (primary, secondary, and early latent): 325
- Amount of budget increase: $500,000
- Would you like to enter information about disease intervention specialists in your program? YES
- Number of DIS employed: 30
- Percentage of chlamydia cases interviewed: 7%

Note: If you want to use your own program data to make this exercise more realistic, you are encouraged to do so. If you do use your own data, be sure to note that in the comments below.

Step 3: Reflect on your experience entering values in pages 1-5. In the box below, list the thoughts/questions that occurred to you when entering the inputs. For example, was there anything confusing about the input process? What usability problems did you encounter?

Comments on the process of entering input values (pages 1 through 5):
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Step 4: Review the reminder and results on pages 6-8. On page 5, click "Next screen" to continue. Read the reminder on page 6 and click the box to show results. Review the results and additional information about how to interpret the results (page 8). In the box below, share your thoughts about the results. For example, is the reminder clear? Is it easy to interpret the results? Are the results presented in a format that is useful for your information needs? Do you have any other thoughts about pages 6 and 7?

Comments on the reminder and results (pages 6 and 7):
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Step 5: Explore the advanced options that are available on the "advanced options menu." Go back to the main "results" page and click, "See advanced options." Explore the four advanced options to review the calculations and assumptions. In the box below, share your thoughts about the advanced options. Are these the most important assumptions that you would want to tailor for your information needs? Are the "automatic estimates" reasonable baseline assumptions? Are these user-defined options easy to understand and revise?

Comments on the advanced options (advanced options menu and subsequent pages):
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Step 6: Reflect on how you could use this tool for your own jurisdiction. Please think about how you could use this tool in your own work. What are some specific ways that you could use this tool in your own work?

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Do you have any suggestions for enhancing the tool to make it more useful for your current and future information needs?

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If you did NOT use your own program data to fill out the tool, how much effort do you think it would take to locate the inputs? Are there any inputs that are particularly difficult or impossible to obtain for your jurisdiction?

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Do you have any other feedback about SPACE Monkey that was not covered above?

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THANK YOU!

Please email your completed form to Bahareh Ansari (bansari@albany.edu). We look forward to speaking with you in a live interactive stakeholder feedback session!

2. Focus Group Guide for State Public Health Professionals

1. **Introduction**

- Review informed consent process
- Provide background on the evaluation study and purpose of today's focus group
- Explain how the preparatory exercise relates to the focus group questions
- Answer participants' questions about the study
- Summarize the four topics that will be covered today

2. **Prior Familiarity with and Use of Modeling Tools**

In your preparatory exercise, you had a chance to explore the STIC Figure and SPACE Monkey tools, reflect on how these tools could be used in your own work, and identify ways to improve these tools. We will start today's conversation by first asking you about your prior familiarity with and use of these tools.

Prior to completing the preparatory exercise, had you ever heard of STIC Figure or SPACE Monkey?

***Probe**: How did you hear about the tool(s)?*

What did you do with the tool(s)? What was the purpose of your analysis? [*Note*: Skip this question if participants had no prior awareness.]

***Probe**: What question did you want to answer with the tool? What was your motivation for using it?*
***Probe**: What did you do with the findings from the model (e.g., using for an internal program decision, including in a policy brief, etc.)?*
***Probe**: What happened as a result of your analysis?*
***Probe**: How did you feel about the usability of the tool?*

3. **Usability Enhancements**

Our next topic is how to enhance the usability of the model. In the preparatory exercise, the different steps guided you through the process of entering values, exploring the model assumptions, and reflecting on usability problems.

What usability problems did you discover when working on the preparatory exercise?

***Probe**: Did you experience usability problems when entering input values?*
***Probe**: Were you able to use your own data?*
***Probe**: Were results presented in a format that was easy to understand and useful for your information needs?*
***Probe**: Did you find one tool easier to use? Why?*

How could we enhance the usability of the tools?

***Probe**: Do you have a preference on the platform (e.g., the current downloadable Excel format versus an online tool)?*

***Probe**: Are there different ways to present the results that would be more useful (e.g., a printable PDF with charts)?*

Should these tools be kept separate or combined? Why?

4. Review Conceptual Models

Our last two discussions will focus on how we can improve the tools for the future. First, we will discuss the underlying conceptual model and assumptions. We will finish our conversation with discussion around how you could use these tools in the future.

There is a common saying that, "All models are wrong, but some are useful." It is challenging to design models that strike the right balance between being simple enough to understand and fit the available data versus adding enough complexity to be realistic.

Do the models adequately capture the epidemic and STD programming environment?

***Probe**: What aspects of your STD programs are missing from the model?*

***Probe**: Are there any assumptions that need to be updated to reflect recent changes to the STD epidemic and programs?*

***Probe**: The SPACE Monkey tool allows you to enter information about the number of DIS. Is this relevant to your state and other jurisdictions, given differences in centralized versus decentralized local health department governance, the new supplemental funding for the DIS workforce, the COVID pandemic, or other environmental changes? (NOTE: This question was for state-level stakeholders only.)*

It is desirable to add complexity to tailor the models to your jurisdiction but adding more details and customization requires that model inputs be available. If you were to use this tool, how much effort would it take to locate the inputs for your jurisdiction?

***Probe**: Which inputs would be easy to obtain with available data?*

***Probe**: Which inputs would be difficult or impossible to obtain?*

***Probe**: How would you assemble the inputs needed to customize the model for your jurisdiction? What surveillance or STD program data would you use? Who would run the analysis?*

***Probe**: Both models have advanced settings that allow for more customization. If you were doing this analysis, which inputs would you change?*

5. Future Planned and Aspirational Tool Use

We now want to discuss ways in which you could use these tools in the future.

In Step 6 of the preparatory exercise, we asked you to think about specific ways that you could use the tool in your own work. Can you please share your ideas?

***Probe**: What could you do with the models in their present form?*

***Probe**: What are some other use cases, if we were to enhance the conceptual design or functionality of the tools?*

What are you most likely to do with these tools in the next year?

***Probe**: Of the use cases you described, what is the highest priority? Why?*

***Probe**: How could you use these tools to communicate with state policymakers for budget requests or for prioritizing resources? What is the likelihood that you would use the tools in this way?*

6. Closing question

We covered a lot of ground today and before we end our session, we want to give you an opportunity to share your final thoughts.

Do you have any other suggestions for these tools that we have not yet discussed?

Do you have any other final reflections?

Thank you for taking the time to complete the preparatory exercise and speak with us today.

3. Focus Group Guide for Local Public Health Professionals

1. **Introduction**

- Review informed consent process
- Provide background on the evaluation study and purpose of today's focus group
- Explain how the preparatory exercise relates to the focus group questions
- Answer participants' questions about the study
- Summarize the four topics that will be covered today

2. **Prior Familiarity with and Use of Modeling Tools**

In your preparatory exercise, you had a chance to explore the STIC Figure and SPACE Monkey tools, reflect on how these tools could be used in your own work, and identify ways to improve these tools. We will start today's conversation by first asking you about your prior familiarity with and use of these tools.

Prior to completing the preparatory exercise, had you ever heard of STIC Figure or SPACE Monkey?

***Probe**: How did you hear about the tool(s)?*

What did you do with the tool(s)? What was the purpose of your analysis? [*Note*: Skip this question if participants had no prior awareness.]

***Probe**: What question did you want to answer with the tool? What was your motivation for using it?*

***Probe**: What did you do with the findings from the model (e.g., using for an internal program decision, including in a policy brief, etc.)?*

***Probe**: What happened as a result of your analysis?*

Can you describe your experiences working with the tool(s)? [*Note*: Skip this question if participants had no prior awareness.]

***Probe**: What went well? In what ways was the tool easy to access and use?*

***Probe**: What did not go well? What challenges did you encounter?*

3. **Usability Enhancements**

Our next topic is how to enhance the usability of the model. In the preparatory exercise, the different steps guided you through the process of entering values, exploring the model assumptions, and reflecting on usability problems.

Our state-level respondents identified the following usability problems: _____. In what ways were these consistent or different from your experiences?

***Probe**: Were these the same as your major usability problems?*

***Probe**: Did you experience any additional usability problems?*

Our state-level respondents recommended the following usability enhancements: _____. To what extent do you agree or disagree with these suggestions?

***Probe**: Which of these recommended enhancements would be useful for your own purpose?*

***Probe**: Are there any recommended enhancements that would not be useful?*

***Probe**: Do you have any other recommendations that we have not yet discussed?*

4. Review Conceptual Models

Our last two discussions will focus on how we can improve the tools for the future. First, we will discuss the underlying conceptual model and assumptions. We will finish our conversation with discussion around how you could use these tools in the future.

There is a common saying that, "All models are wrong, but some are useful." It is challenging to design models that strike the right balance between being simple enough to understand and fit the available data versus adding enough complexity to be realistic.

Do the models adequately capture the epidemic and STD programming environment?

***Probe**: What aspects of your STD programs are missing from the model?*

***Probe**: Are there any assumptions that need to be updated to reflect recent changes to the STD epidemic and programs?*

In what ways do the assumptions differ for state versus local programs?

***Probe**: Are there any critical changes that need to be made to the conceptual design or assumptions to make this model relevant for local health departments?*

It is desirable to add complexity to tailor the models to your jurisdiction but adding more details and customization requires that model inputs be available. If you were to use this tool, how much effort would it take to locate the inputs for your jurisdiction?

***Probe**: Which inputs would be easy to obtain with available data?*

***Probe**: Which inputs would be difficult or impossible to obtain?*

***Probe**: How would you assemble the inputs needed to customize the model for your jurisdiction? What surveillance or STD program data would you use? Who would run the analysis?*

***Probe**: Both models have advanced settings that allow for more customization. If you were doing this analysis, which inputs would you change?*

5. Future Planned and Aspirational Tool Use

We now want to discuss ways in which you could use these tools in the future.

In Step 6 of the preparatory exercise, we asked you to think about specific ways that you could use the tool in your own work. Can you please share your ideas?

***Probe**: What could you do with the models in their present form?*

***Probe**: What are some other use cases, if we were to enhance the conceptual design or functionality of the tools?*

What are you most likely to do with these tools in the next year?

***Probe**: Of the use cases you described, what is the highest priority? Why?*

Our state-level respondents identified the following use cases: ____. As a local jurisdiction, how do your information needs related to STD programs and budgeting differ from states?

***Probe**: Which state-level use cases resonate with your own local information needs?*

***Probe**: In what ways do your information needs differ from state health departments?*

In our work to update these models, we have been thinking about the ideal target audience. To what extent would these models be useful at the local level?

***Probe**: Are these tools relevant to most local health departments?*

***Probe**: Are there certain types of local health departments that would find these more useful than others?*

6. Closing question

We covered a lot of ground today and before we end our session, we want to give you an opportunity to share your final thoughts.

Do you have any other suggestions for these tools that we have not yet discussed?

Do you have any other final reflections?

Thank you for taking the time to complete the preparatory exercise and speak with us today.

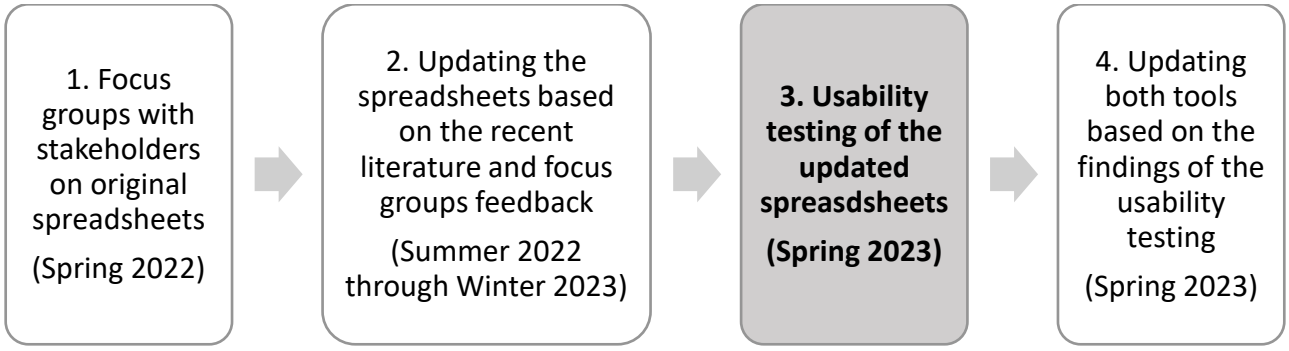
4. Live Exercise for Usability Evaluation Participants

Background and Instructions

What are the STIC Figure and SPACE Monkey tools? These interactive Excel cost modeling tools enable state and local STD programs to: 1) estimate the medical and indirect productivity costs saved from treating diagnosed cases of chlamydia, gonorrhea, and syphilis (*STIC Figure*), and 2) estimate the potential effects of increases or decreases in a jurisdiction's STD prevention funding on future cases of STDs and their direct medical costs (*SPACE Monkey*).

What is the purpose of this project? We are updating STIC Figure and SPACE Monkey to incorporate new data and make them more user-friendly. Ultimately, we want them to be more accessible and relevant to the current information needs of the state and local STD directors. To do that, we're asking you to help us understand what works - and what doesn't - about these tools in their current form.

What are the phases of this project? Last spring, we held focus groups with state and local stakeholders for feedback on the original spreadsheet models. After that, we updated the models based on the recent literature and the feedback received in the focus groups. We are currently conducting usability testing of the updated spreadsheet models to understand what works and what does not work in action. Findings on usability will be used to update both tools.



What is the plan for today's meeting? We want to test the usability of the updated tools. We have a guided exercise for you to complete "live" so that we can find the usability problems in action. Usability "testing" is not a test of the users and their understanding, but rather a test of the ***product*** and its ability to meet user needs. We will ask you specific questions while you are working. In the end, we will ask you to fill out a questionnaire about your experience with the spreadsheet, and we will discuss your final thoughts.

Instruction for the usability testing:

- There are no wrong answers in this process.

- While working on the questions, please share your screen, and use your cursor to point to where you are looking on your screen. This will help us understand if the spreadsheet can be used as expected.

- Please verbalize your thoughts when working on the questions. An example of verbalizing thought could be, “This button is the first thing that caught my eye. I am wondering what this button will do, and I’m going to click to find out.”

- Please also tell us about any issues you may find when working with the spreadsheet or things that you find helpful or interesting. For example, “I’m having trouble understanding this filter. The menu does not make sense to me.”

- During your work, if any of the terms are unclear, please try to find an explanation on the sheet. If the explanation is not enough, please let us know so we can fix it for future users.

- It is hard to have both the questions and the spreadsheet open on one screen. Please feel free to close this document or minimize it. Let us know if you want us to read the questions.

- As you answer the questions, please keep in mind that we are evaluating the tool and would like to know about everything that users may find confusing. Please feel free to work on each question at a normal and comfortable pace for you.

- We are not going to talk much because we are interested to know if it is easy for people to use the spreadsheet when they are alone. But, if there is a technical difficulty or something that keeps you from answering questions, please ask, and we will be here to respond.

Let's start with STIC Figure.

Step 1: Download and open the attached STIC Figure spreadsheet.

- Download the attached STIC Figure spreadsheet on your computer.
- Open the spreadsheet.
- Select "Enable Content" if prompted.
- Begin!

Step 2: Enter user inputs.

- Take a few seconds to explore the user input sheet and then enter the following inputs.
- Name and year of the program: Jupiter, 2022
- Chlamydia
    - Confirmed cases treated: 11,000 Male, 18,000 Female
    - Persons receiving epi-treatment: 3,300 Male, 5,400 Female
    - Volume of EPT distributed: 1,320 Male, 1,280 Female
- Gonorrhea
    - Confirmed cases treated: 5,000 Male; 4,000 Female
    - Persons receiving epi-treatment: 1,500 Male; 1,200 Female
    - Presumptive cases based on chlamydia diagnosis: 50 Male, 50 Female
- Syphilis
    - Confirmed cases treated: 300 Male; 25 Female
    - Persons receiving epi-treatment: 150 Male; 12 Female
- HIV
    - Newly diagnosed HIV cases linked to care: 320 Male; 80 Female
    - Previously diagnosed HIV cases linked to care: 110 Male; 80 Female
    - Persons provided with a PrEP referral: 65 Male; 85 Female
- Optional inputs
    - % Pregnant among syphilis cases: 18%
    - % MSM among syphilis cases: 50%
    - % MSM among HIV cases: 65%

Step 3: View the output and interpretation guide.

- Click "show results." You'll be navigated to a new page.
- Take a few seconds to explore the output and interpretation guide, and then answer the following questions.
- Please interpret the output in your own words. What are the main findings?
- How do you interpret the direct medical costs averted through "STI infections?" (Note: you can use the interpretation guide for more information about this cost item.)
- Print the output into Pdf.

Step 4: Edit and export the output.

- Click “Edit output.” You’ll be navigated to a new page.
- Take a few seconds to explore this page and then answer the following questions.
- Filter the output for a “Syphilis treatment” program that focuses on “Females.”
- Choose an output table or chart that you find most helpful for communicating the benefits of the STD programs.
- Open a Word or PowerPoint on your computer and copy/paste the chart or table for your reports.
- Clear all filters to see all the data again.

Let’s move on to SPACE Monkey next.

Step 5: Download and open the attached SPACE Monkey spreadsheet.

- Download the attached SPACE Monkey spreadsheet on your computer.
- Open the spreadsheet.
- Select “Enable Content” if prompted.
- Begin!

Step 6: Enter user inputs.

- Take a few seconds to explore the user interface sheet and then enter the following inputs.
- Size of population served by STD program (all ages): 100,000
- Reported number of chlamydia cases: 2,000
- Reported number of gonorrhea cases: 500
- Reported number of primary and secondary syphilis cases: 20
- What was your previous annual funding amount? $100,000
- What is your new annual funding amount? $150,000

Step 7: View the output and the interpretation.

- Take a few seconds to explore the output and interpretation, and then answer the following questions.
- Please interpret them in your own words. What are the main findings?
- How do you interpret the costs saved from “STI-attributable HIV?”
- Do the text and table meet your needs?

Step 8: Advanced options.

- Go to the advanced options page.
- Take a few seconds to explore the page.
- Change the time frame to 5 years on the summary table and all associated tables and charts.
- Choose an output table or chart that you find most helpful for communicating the benefits of STD programs.
- Open Word or PowerPoint on your computer and export the chart or table.

Step 9: Complete an online questionnaire.

- Please fill out a questionnaire about your experience with the spreadsheet.

https://forms.office.com/r/xSJJNNk4ii

Step 10: Final feedback and comments.

- How did you find the updated spreadsheet models overall?
- Con you compare and contrast the features of the two models? What were the most helpful and least helpful features?
- Was there anything you wished were different?
- Do you have any final thoughts or comments?

THANK YOU!