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Abstract

B[illegible]: Modeling tools have potential to aid decision making for program planning and evaluation at all levels, but are still largely the domain of technical experts, consultants, and global-level staff. One model that can improve decision making for maternal and child health is the Lives Saved Tool (LiST). We examined respondents' perceptions of LiST's strengths and weaknesses, to identify ways in which LiST – and similar modeling tools – can adapt to be more accessible and helpful to policy makers.

M[illegible]: We interviewed 21 purposefully sampled LiST users. First, we identified the characteristics that respondents explicitly stated, or implicitly implied, were important in a modeling tool, and then used these results to create a framework for reviewing a modeling tool. Second, we used this framework to categorize the strengths and weaknesses of LiST that respondents articulated.

[illegible]: Two overarching qualities were important to respondents: usability and accuracy. For some users, LiST already meets these criteria: it allows for customized input parameters to increase specificity; the interface is intuitive; the assumptions and calculations are scientifically sound; and the standard metric of "additional lives saved" is understood and comparable across settings. Other respondents had different views, although their complaints were typically not that the tool is unusable or inaccurate, but that aspects of the tool could be better explained or easier to understand.

G[illegible]: Government and agency staff at all levels should be empowered to use the data available to them, including the use of models to make full use of these data. For this, we need tools that meet a threshold of both accuracy, so results clarify rather than mislead, and usability, so tools can be used readily and widely, not just by select experts. With these ideals in mind, there are ways in which LiST might continue to be improved or adapted to further advance its uptake and impact.

Background

High on the international health agenda is the need to make better use of data for decision making [1]. There is widespread appreciation of the value of health program data, and increasing expertise in collecting them, but comparatively limited tools and guidance on how data should be used, particularly at district and regional levels. Many collected data are compiled into national or global aggregates without being used at lower levels. Other data are neglec[illegible]

national and district health offices, respondents said that staff need to be able to use a tool with only minimal experience or training.

> “There is a big disconnect between global level strategic think tanks that run international organizations, NGOs, where they sit and are familiar with evidence, research, methods, and have good access to all of the information. ... We don't want to further this situation where there is always a need for assistance. We really want to make knowledge and

> “The problem is that LiST is only as strong as the data that it has, and data is hard to come by at the best of times and otherwise we rely on five-year intervals for DHS data, and that can be misleading sometimes or have gaps.”

> “Also a big challenge that we have is the quality of data that we’re using.”

Some users said that it was up to the user to provide their own input data. Others expected these data to be available in LiST by default. LiST currently comes with default health status data, intervention effectiveness values, and coverage data, drawn from DHS, MICS, and other surveys [7]. The fact that these defaults are built in increases the tool’s usability. The validity of the defaults, and their appropriateness for the scenario the user wants to model, increases the tool’s accuracy. Currently LiST only has default data for national-level projections.

> “LiST really does provide a fantastic vessel... It uploads DHS data and other information from the source, which helps consolidate information. It is quite complex with so many factors that have sophisticated ways of interacting with each other. It helps to have a lot of the math and number crunching being done by the software.”

Respondents had mixed thoughts on the usability of the LiST interface for running models. Most seemed to be happy with the interface, including one user who said it was “intuitive”, but a few respondents said they found it challenging to manipulate.

> “We’ve actually created a few Excel based modeling tools to try to do the same thing, actually that is one of the nice things about LiST is the standardization of the software to produce those estimates. Rather than different teams using excel programs with different assumptions and different inputs available to them.”

> “I have seen [user interface] progress drastically in the past seven years, when I think about what we had originally and what we have now, it’s incredible. I

the authors were very cautious and said the results were kind of inconclusive, whereas in LiST it didn't mention that and just had an effect size and referenced this systematic review."

often related to the characteristics identified as strengths. For example, some respondents were overwhelmed by LiST's many input parameters, but others valued the wide array of options for customizability. Some appreciated that "additional lives saved" was an easy metric to interpret, while others found this simplistic and open to misinterpretation. Ease-of-use appealed to one user, but over-simplification was limiting to another.

This highlights something of a trade-off between usability and accuracy, with increased accuracy necessarily making the tool more complicated to use. Consider, for example, the need for input data. A completely user-friendly tool might work straight "out of the box", with limited user attention needed to fine-tune input parameters. The user would not have to set custom coverage data or effectiveness values, but could instead draw on default data. But by necessity, these default values would be more "generic" than if the user had set them themselves, and because the values would be generic, the results would be less specific, or accurate, to the user's context.

Consider also the use of "single indicator" inputs. Currently in LiST, instead of entering detailed, age-specific data on stunting, users can enter a single value and LiST will make assumptions about how this value disaggregates to age-specific categories. For childbirth interventions, a single indicator of institutional delivery will be separated by LiST into intervention-specific coverage values using a default algorithm [8]. In both cases, taking the less demanding route of using a "single indicator", increases LiST'

There are aspects of usability that are not tied to the model itself or even the interface, such as the computer operating system and specifications required to run the software. Users in some contexts may require offline capabilities, but a web-based version could open up more options for enhanced usability. The LiST team, in partnership with the broader group that develops Spectrum, are working on an online version of LiST. Such an online version could allow for referencing up-to-date sources, immediate version control (always using latest version of the model), and shared user accounts. For some users and use cases, a mobile version of LiST might also be appreciated. For advanced users, LiST functions could be made available within a statistical package such as R, which would enable statisticians to incorporate LiST calculations as part of broader functions and models.

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Arguably LiST does a good job of allowing for both generic projections and complex, custom projections. The problem our respondents identified was that some users do not understand the options available to them and the implications of their choices. LiST has built-in documentation, but this could continue to be developed, with more immediate and clear explanations for the default assumptions that have been made. This could include simple, summary descriptions for those with limited time and skills (e.g. how to correctly interpret results), and more lengthy descriptions for those who want to understand the details (e.g. scientific justification and explanation of mathematical calculations).

If LiST is to achieve greater uptake there needs to be a way for self-directed users to pick up the tool themselves and start working with it independently. If users must always attend a training session, this will inevitably limit uptake. There needs to be a way for potential users who cannot attend trainings, or who have attended trainings in the past, to start (again) themselves. With this in mind, the LiST team continues to invest in training resources, and online webinars, to help self-directed users run both simple and complicated projections.

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LiST needs flexibility and customizability where it is wanted, and the best possible default data and assumptions where it is not. The LiST team already makes great efforts to maintain default data, including coverage and cause-of-death data for 157 countries. LiST also leads scientific efforts to obtain reliable effectiveness values [7, 10]. Although LiST could take even greater responsibility to curate a set of reliable default data (e.g., regional or district models, or alternative demographic projections), this is arguably beyond LiST's mandate and in any case would require a big investment of resources. Ultimately, for specific projections, users may need to bring their own data to the table. LiST could be clearer about what is required, how to get it, and the implications of using generic or low-quality data. Advocating for data responsibility in this way would not only improve the accuracy of LiST results, but would foster greater awareness among users, and the wider international community, of the need for and value of high-quality data.

Conclusions

Organizations in all sectors are placing increasing emphasis on data for decision making. To achieve the gains of this data revolution in public health, government and agency staff at all levels should be empowered to use the data available to them, including the use of models to implications

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Individuals gave consent to publication before being interviewed. All identifying information has been removed.

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