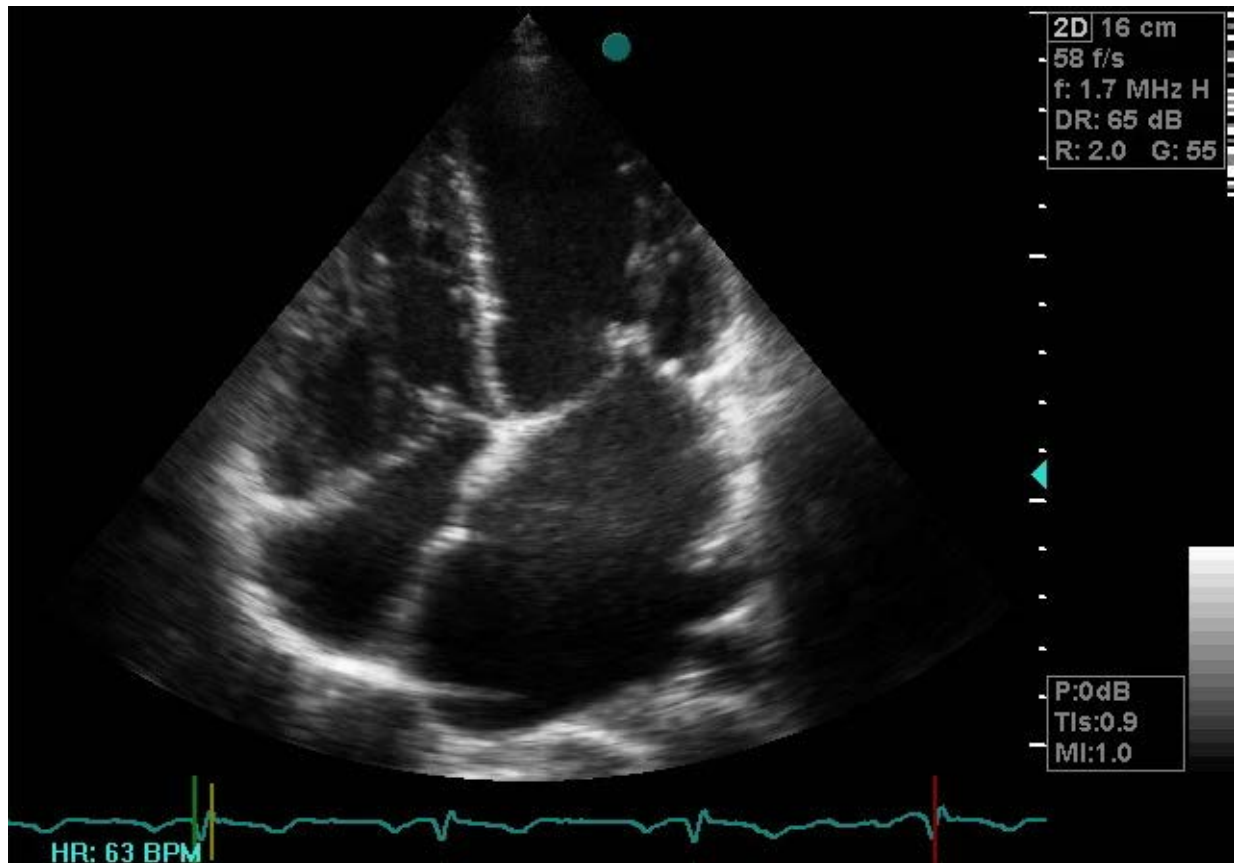


# A new tool to determine cost-effective control of rheumatic heart disease

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Rheumatic mitral stenosis visualized by transthoracic echocardiogram, South Africa, 2009. Credit: Bongani Mayosi

Based on recent estimates, there are about 32 million cases of rheumatic heart disease (RHD) worldwide, which cause 275,000 deaths per year.

Effective drugs and surgical procedures to prevent and treat the disease exist, but they can be expensive and are under-used in the resource-poor settings where disease burden is highest. A study published in *PLOS NTDs* introduces a tool that helps health officials to make smart decisions on prevention and treatment of RHD.

Acute rheumatic fever (ARF) and RHD develop as complications of inadequately treated strep throat or scarlet fever, both caused by infections with group A *streptococcus* bacteria. Ongoing inflammation accompanying ARF can cause damage to the heart valves, eventually leading to [congestive heart failure](#), stroke, and death. Proper antibiotic treatment of initial infections and prophylactic antibiotic treatment of individuals with a history of ARF or RHD can prevent disease progression, and valve surgery can prevent and treat heart failure.

Because there are few guidelines on which prevention and treatment options are affordable and cost-effective, David Watkins, from the University of Washington, USA, and colleagues set out to develop an economic evaluation tool that provides guidance on how to choose among various interventions and allocate resources to control programs. Their hope is that the tool will help to integrate ARF/RHD priorities within the recent commitment to provide [universal health coverage](#) in Africa.

To illustrate the use of the freely available tool, the researchers applied it to a hypothetical African country. They considered three general interventions to reduce RHD: Scaling up primary prevention (PP) services to improve treatment of pharyngitis in primary care settings; scaling up secondary prevention (SP) services to create and maintain a registry of individuals with a history of ARF or RHD who then receive prophylactic penicillin on a regular basis; or increasing coverage of heart valve surgery (VS), either by building a surgical center in country or by sending affected individuals for surgery abroad.

The researchers stress that the hypothetical country application is based on a number of assumptions and associated uncertainties, and thus is illustrative rather than prescriptive. Nonetheless, there are some broad conclusions: RHD prevention is probably more cost-effective than RHD treatment (i.e., by surgery), and PP in particular is likely to be cost-saving in the long-term. Increasing access to VS could be cost-effective in some settings, though sending affected individuals abroad for surgery would be less costly than building surgical centers in country. Countries similar to the hypothetical case, the researchers recommend, could consider invest limited resources in PP and SP until full coverage is achieved before moving onto VS.

Besides cost-effectiveness per se, overall affordability is a vital consideration for any public health intervention. In the example illustrated here, PP would save money in the long run, but the savings would only be realized after a large up-front investment (an estimated \$874,000 for the total population, or about \$0.18 per person in their example). This investment in PP would rapidly reduce ARF and result in cost savings from cases of ARF and RHD averted. SP and VS would not be cost saving, however, and their annual incremental costs would be much higher.

The results, the researchers note, depend on the number of new cases per year and the rate of progression from ARF to RHD. Unfortunately, there are few recent estimates of these parameters in Africa, and high quality studies in this area are needed. There are also very few data on the costs for PP, SP, and VS in Africa, and the example relied heavily on 'best guesses' or extrapolation of costs from other parts of the world. End users of the tool, the researchers state, will need to collect their own primary cost data to get the most out of the analysis.

The researchers recognize that low-income countries have a large number of competing health priorities and limited resources, and that

priority should usually be given to the most effective and less costly interventions. Nonetheless, for the hypothetical country studied here, they say their "analysis suggests that PP would be very effective and relatively inexpensive and could easily be included in any list of first-priority interventions".

**More information:** Watkins D, Lubinga SJ, Mayosi B, Babigumira JB (2016) A Cost-Effectiveness Tool to Guide the Prioritization of Interventions for Rheumatic Fever and Rheumatic Heart Disease Control in African Nations. PLoS Negl Trop Dis 10(8): e0004860. [DOI: 10.1371/journal.pntd.0004860](https://doi.org/10.1371/journal.pntd.0004860)

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