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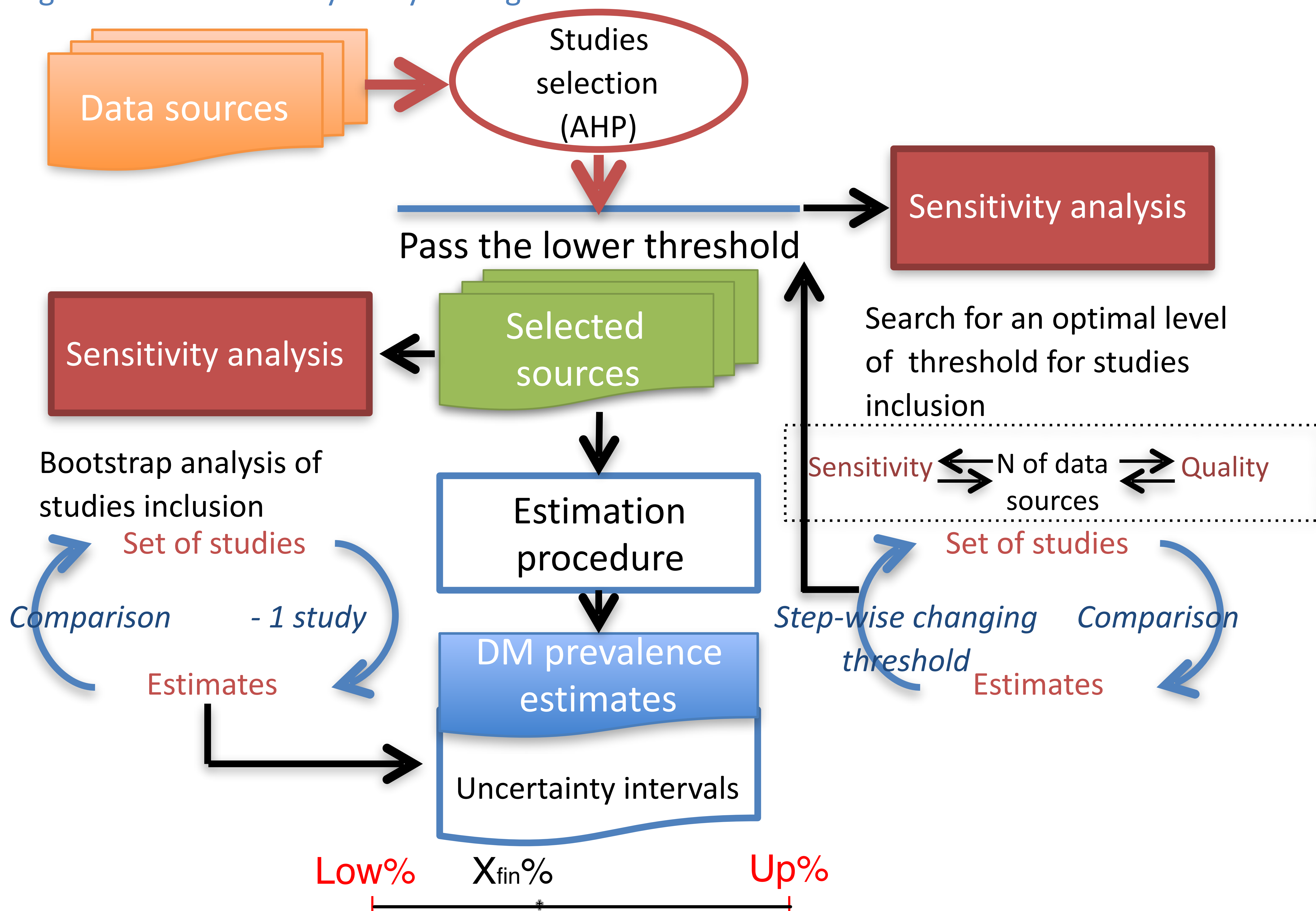
Introduction

The International Diabetes Federation (IDF) uses a transparent reproducible methodology to generate global estimates of diabetes prevalence in adults (20–79 years). However, previously no uncertainty measurements have been reported for this estimate.

Methods

The Atlas methodology uses the Analytical Hierarchy Process (AHP) to select a sample of high-quality studies from a database of over 800 studies conducted in over 160 countries. In order to quantify the potential sources of uncertainty associated with this study selection process, two separated analyses were performed: (1) a threshold sensitivity analysis to find the optimal lowest level of study acceptance; (2) a bootstrap analysis of the sensitivity of the global prevalence estimate to the study selection process.

Figure 1. The sensitivity analysis diagram.

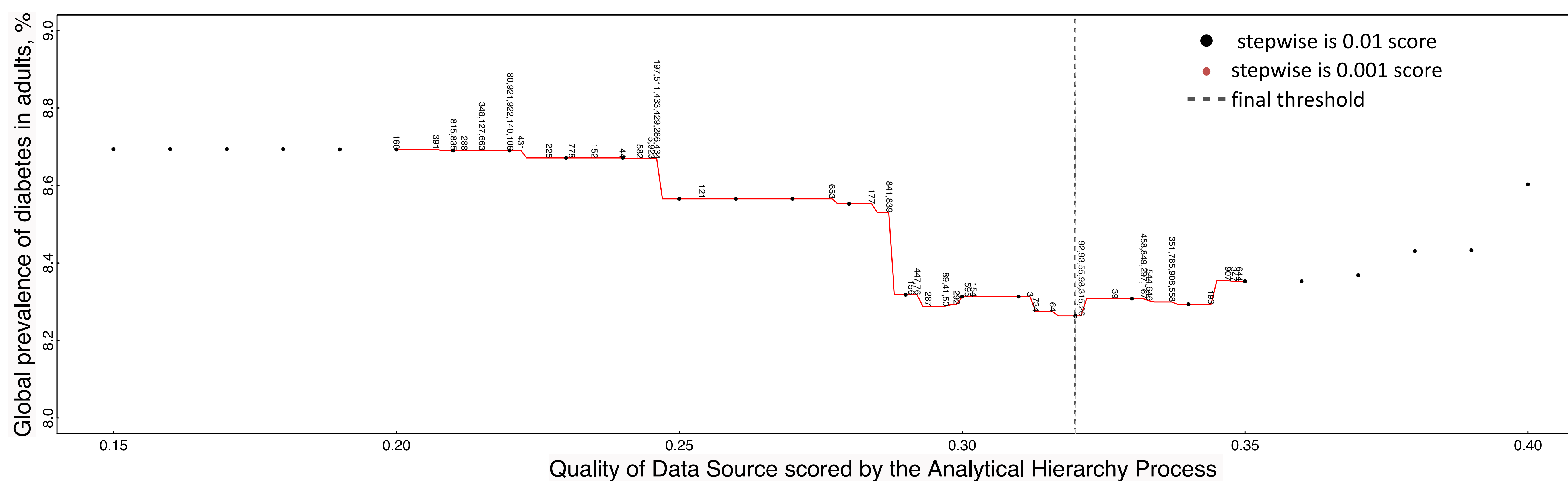


Results

This cut-point sensitivity analysis demonstrated that variation in the lower threshold of the Analytical Hierarchy Process score could have shifted the estimated IDF Diabetes Atlas global prevalence from -0.87% to +0.59% (i.e. 7.80% to 9.26%) for adults aged 20-79 in 2014.

The bootstrap analysis showed that removing one study from the list may have led to shifting the global prevalence estimate from -0.53% to +0.20% (i.e. 7.86%-8.59%) for 2014.

Figure 2. The effect of changing the lower inclusion threshold of the quality score on the global estimate of diabetes in adults.



Summary

The cut-point sensitivity analysis improves the study selection process by increasing its flexibility, and the bootstrap analysis demonstrates the effect of excluding single studies from diabetes prevalence estimates. In the 7th edition of the IDF Diabetes Atlas, bootstrap analysis results were integrated as a component of the uncertainty estimates for the diabetes prevalence at country, regional and global levels. Thus, these uncertainty measurements will permit greater comparability of IDF results with other sources and over time.