Estimating the costs of scaling up HIV self testing: Incremental cost multipliers

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Background: Economic theory postulates non-linearities in total, average and marginal costs as programmes move from small scale introduction to large scale routine implementation.   Fixed training and transportation costs and indivisible personnel cost lead to economies of scale, while demand saturation and other demand side constraints, such as ease of access and willingness to uptake, drive diseconomies of scale. To date few papers provide guidance for estimating the costs of scaling up infectious disease screening interventions. This study presents a practical approach for estimating scale up budgets based on programme accounting data using the case of HIV self testing in Zimbabwe.

Methods: We present a review of current approaches of modelling costs at scale from the highly simplistic, multiplying average costs by projected quantities, to more complex approaches predicting scale up costs from cost-function estimates requiring extensive data inputs. Finally, we propose an extension to the accounting identity approach first developed by Meyer-Rath and Over that considers clinic-level fixed and variable costs. Our proposed approach, using incremental cost multipliers, uses pilot expenditure data to categories at what level expenditures are fixed and detailed programme expansion plans to estimate future scale.

Results: Costs are disaggregated and defined as fixed at different levels (region, district, clinic, provider type and output), then multiplied by the estimated scale of the appropriate indicator. For example, training activities may be undertaken at regional level with very low marginal costs per additional trainee or kit distributed. To estimate training costs to expanded to new regions, the first region's training costs are simply multiplied by the number of regions to be expanded into. While test kit costs directly vary by the unit of output, test distributor uniforms and salaries will grow by the number of providers, and transport and supervision costs may need numbers of new clinics as multiplier.

Conclusion: While maintaining practicality and simplicity, the incremental cost multiplier approach, by identifying key drivers of costs and incorporating specific programme plans, provides a more nuanced approach to estimating scale up costs than using simple average costs. This approach allows programmes to use their own expenditure data to better model costs of extending programmes, without the need for an extensive costing studies and statistical analysis, and can be built into accounting systems from the start to reduce ex post analysis.