

Cost Effectiveness Analysis of Combined Phenotype and Genotype Drug Resistance Testing Versus Genotyping Alone

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BACKGROUND: Previously published studies concluded that genotypic testing for resistance to antiretroviral (ARV) therapy is cost-effective when compared to clinical opinion alone. We compared the cost-effectiveness of combined phenotype and genotype testing (PTGT) vs. genotyping alone (GT).

METHODS: A Markov model was used to determine the cost per quality adjusted life year (QALY) and incremental cost-effectiveness of using PTGT vs. GT. Data were derived from prior studies which examined physician choices of ARV regimen based on GT, PT, or PTGT information. ARV regimen score was derived using a phenotypic susceptibility score (PSS), calculated by summing the number of susceptible drugs within each regimen. Patient quality of life and survival outcomes were derived from existing PSS datasets among which treatment success was greater for ARV regimens with a PSS \geq 3 compared to ARV regimens with PSS \leq 2. Baseline treatment costs were estimated conservatively at \$1,500 per month for ARV, and did not include other costs of care. Results were calculated separately for moderately- vs highly-ARV treatment experienced patients.

RESULTS: For moderately experienced patients, costs per QALY over 6 years was nearly identical for PTGT and GT (\$27,343 vs. \$27,671, respectively), despite the higher cost of PTGT testing. Overall model results were similar to previously published reports on the cost-effectiveness ratio for GT. The incremental cost-effectiveness ratios (ICERs) of PTGT to GT are \$15,977 per QALY for moderately-experienced patients and \$13,442 per QALY for highly-experienced patients. Further, as ARV costs increased, PTGT became more cost-effective compared to GT.

CONCLUSION: PTGT is more cost-effective than GT for moderately- and highly-ARV experienced patients and cost-effectiveness ratios improve as cost of ARVs and care increases.