METHODS: We used a non-parametric approach employing Monte Carlo simulation to determine the expected value of perfect information (EVPI) for the full model and for a particular model parameter (probability of resistance). We incorporated empiric distributions of the net benefits associated with each treatment for patients found to have sensitive and resistant bacteria (4 distributions for each model) created from 1,000 bootstrap replications of the mean cost and effect. The bootstrap replicates involved resampling from original cost and effect data about 210 patients of whom 47 had bacteria resistant to TMP/SMX. In the base case the net benefits were constructed from the mean cost and effect pairs by re-scaling the effects into a monetary value assuming a societal willingness-to-pay $200 to prevent one failure of treatment for pyelonephritis. The model for the population assumed an incidence of 0.4% per annum for pyelonephritis in the US and UK and that the decision would be valid for 10 years.

RESULTS: Ciprofloxacin is the a priori choice because it is associated with the maximum net benefit for each diagnostic scenario for each diagnostic setting in the model. Nonetheless, there is still residual uncertainty and the EVPI for the decision is $2.18m for the US and £1.65m in the UK. However, the partial evaluation revealed that the EVPI for the prevalence of resistance is only $3,048 in the US and £1,876 in the UK.

CONCLUSIONS: Uncertainty about the prevalence of resistance makes a minor contribution to the overall EVPI for the decision.

COST-EFFECTIVENESS OF NEW RAPID SCREENING TECHNOLOGIES FOR GONORREA IN URBAN EMERGENCY ROOM DEPARTMENTS
Aleddort J, Goldie S
Harvard University, Boston, MA, USA

OBJECTIVES: The prevalence of Neisseria gonnorrhoeae (GC) among adolescents and young women attending urban emergency rooms (ER) ranges from 3% to 10% but screening has historically not been feasible in this setting. Our objective was to assess the cost-effectiveness of newer technologies that bypass the need for a pelvic exam and reduce loss to follow-up.

METHODS: We developed a state-transition Markov model of the natural history of GC and simulated screening, diagnosis, and treatment in a cohort of 10,000 15-year-old U.S. women. Adopting a societal perspective, we compared no screening to selective age-based screening using either the: 1) ligase chain reaction (LCR) on a urine sample; or 2) rapid immunochromotographic assay (RIA) on a clinician-collected vaginal sample. We assumed 80% of LCR screen-positive women would be treated (20% loss to follow-up) and 100% of RIA screen-positive women would receive immediate treatment. We assumed a peak GC prevalence of 6%. Clinical outcomes included cases of GC, pelvic inflammatory disease (PID), major PID sequelae, and quality-adjusted life expectancy (QALE). Economic outcomes included incremental cost-effectiveness ratios (cost per quality-adjusted life year saved). Data were obtained from population-based studies, national databases and published literature.

RESULTS: Compared to no screening, screening women aged 15 to 24 with RIA was more effective and cost-effective (i.e., dominated) than LCR and cost $1,850 per QALY. The model for the population assumed an incidence of 0.4% per annum for pyelonephritis in the US and UK and that the decision would be valid for 10 years.

CONCLUSIONS: Screening for GC within an urban-ER setting using the new RIA test facilitates rapid screening and treatment and has a cost-effectiveness ratio that is more attractive than many current preventive health interventions.

THE COST OF ANTIRETROVIRAL THERAPY IN THREE CENTRAL AMERICAN COUNTRIES
Becker R, Zaccagnini P, Rattana S
Ovation Research Group, Highland Park, IL, USA

OBJECTIVE: Brazil’s universal access to HIV treatment and drug price reductions have afforded treated large segments of the country’s HIV-infected population. Several countries in Central America have large HIV-infected populations without access to care. This analysis examines the feasibility of applying Brazil’s universal access to treatment and drug price reductions given the economic conditions in three Central American countries: Guatemala (n = 71,050), El Salvador (n = 19,400), and Belize (n = 2,400).

METHODS: Each country’s HIV population not currently receiving antiretroviral therapy was estimated. For each population, the cost of two-drug and three-drug combination antiretroviral therapy was estimated by applying 2000 Brazilian prices (in U.S. dollars). The ratio of drug costs to gross domestic product was determined to measure each country’s relative ability to pay for the cost of treatment. The Brazilian rate of cost savings from averted hospitalizations was subtracted from each country’s drug cost estimates to determine total cost of treatment.

RESULTS: In Guatemala, the drug costs for treating the HIV population ranges between $54.2 (0.117% of GDP) and $335.1 (0.725%) million depending on whether double or triple combination therapy is used. The costs range between $14.8 (0.062%) and $91.5 (0.381%) million in El Salvador, and between $1.8 (0.232%) and $11.3 (1.433%) in Belize. Potential hospitalization costs averted were $80.5 million in Guatemala, $22.0 million in El Salvador, and $2.7 million in Belize. Given these costs averted, the total cost of treatment ranges between ~$28.5 (cost savings) and $252.4 million in Guatemala depending on whether double or triple combination
therapy is used, between −$7.9 and $68.8 million in El Salvador, and between −$888.8 thousand and $8.6 million in Belize.

CONCLUSIONS: Since the ratio of antiretroviral drug costs to GDP was 0.041% in Brazil in 2000, these three Central American countries may have more difficulty affording antiretroviral therapy unless double combination therapy is used.

SESSION II

METHODOLOGY ISSUES I

HANDLING MISSING DATA IN STOCHASTIC COST-EFFECTIVENESS ANALYSIS: THE IMPACT OF IMPUTATION METHODS ON ESTIMATES OF THE PHYSICAL QUANTITIES OF MEDICAL CARE RESOURCE USE

Bell TJ1, Liu J1, Backhouse M2
1Research Triangle Institute, Raleigh-Durham, NC, USA; 2Research Triangle Institute, Manchester, UK

OBJECTIVE: An issue that has recently received attention from health economists is how to handle the problem of missing data in stochastic cost-effectiveness analysis. The purpose of this paper is to highlight the impact that different approaches to the imputation of missing data can have on estimates of the physical quantities of medical care resource use.

METHODS: Medical care resource use data were collected prospectively in a 6-month RCT comparing two treatments for a chronic condition that is characterised by acute episodes. Two approaches of the multiple imputation were used to address the problem of missing data. Method A relied on imputing missing data for total costs and then estimating the physical quantities of medical care resource use. Method B relied on imputing missing data for the physical quantities of medical care resource use and then estimating total costs. Results for physician and nurse visits and days in the hospital were reported.

RESULTS: The two multiple imputation approaches produced different estimates of medical care resource use. For method A, the average number of physician and nurse visits and days in the hospital between the two groups were 5.7 vs. 5.3 physician visits, 1.0 vs. 0.9 nurse visits, and 4.0 vs. 4.7 days in the hospital. For method B the average number of physician and nurse visits and days in the hospital between the two groups were 6.0 vs. 6.3 physician visits, 1.2 vs. 1.3 nurse visits, and 4.0 vs. 5.0 days in the hospital.

CONCLUSIONS: Medical care resource use estimates are sensitive to the imputation approach. Method B builds prediction models specifically for the utilisation components under the imputation and results from the imputed datasets are believed to be less biased. It also provides more flexibility for analysing the cost components.

COST-EFFECTIVENESS VS. COST-UTILITY ANALYSIS: DOES ADJUSTING FOR HEALTH-RELATED QUALITY OF LIFE REALLY MATTER?

Tengs TO, Lin TH
Health Priorities Research Group, University of California, Irvine, CA, USA

The US Public Health Service Panel on Cost-Effectiveness issued a series of recommendations designed to improve the rigor and consistency of cost-effectiveness analyses. While the Panel's individual recommendations are largely sound, they nevertheless vary in importance. That is, the violation of some recommendations will yield dramatically different cost-effectiveness estimates and resource allocation decisions than the violation of other recommendations.

OBJECTIVE: The Panel has advocated the use of quality-adjusted life-years (QALYs) as the best way to evaluate outcomes in a cost-effectiveness analysis. We consider the importance of this recommendation for cancer prevention, screening, and treatment by studying the empirical relationship between cost/life-year and cost/QALY. In addition, we consider whether adjusting for health-related quality of life (QOL) affects the ultimate resource allocation decision implied by the cost-effectiveness ratio.

METHODS: We identified 198 articles reporting two or more outcome measures for the same intervention: cost/life-year, cost/QALY, total life-years, total QALYs, incremental life-years, or incremental QALYs. We calculated a correlation matrix for these outcomes and performed a regression analysis to examine the relationship between cost/life-year and cost/QALY. In addition, we considered whether adjusting for health-related quality of life (QOL) affects the ultimate resource allocation decision implied by the cost-effectiveness ratio.

RESULTS: The correlation between the total life-years and total QALYs associated with the intervention is $0.97 (P < 0.0001). The correlation between cost/life-year and cost/QALY is 0.78 (P < 0.0001). Assuming a $50,000 WTP threshold, adjustment for QOL would affect choice in 7% of cases. With a $400,000 threshold, QOL would affect choice in 2% of cases.

CONCLUSION: The outcome measures of life-years and QALYs are highly correlated with one another. While adjusting for QOL can make an important difference in some economic analyses, it generally does not affect implied resource allocation decisions for cancer prevention, screening, and treatment.

IMPORTANCE OF CONSIDERING SENSITIVITY AND SPECIFICITY OF SCREENING METHODS IN HEALTH ECONOMIC ANALYSES OF DIABETIC NEPHROPATHY SCREENING POLICIES

Palmer AJ, Roze S
CORE Center for Outcomes Research, Basel, BS, Switzerland