INFECTION—Economic Outcomes Presentations

COST-EFFECTIVENESS OF VACCINE DEVELOPMENT AND ENVIRONMENTAL CONTROL AGAINST DENGUE IN SOUTHEAST ASIA
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OBJECTIVE: Dengue infection is a major public health problem in tropical countries, home to 2.5 billion persons. Every year, tens of millions of people get infected and many of them develop acute disease with temporary disability. While improved treatment has lowered the case fatality rate, the high incidence of the disease keeps the absolute burden of death high. Southeast Asia (SEA) is a particularly vulnerable region, where most of the dengue cases occur. Environmental control intervention to control mosquito breeding is expensive, erratic, and very difficult to sustain. A dengue vaccine, currently in steps of development, appears to be a promising public health intervention to dengue control. We conducted a cost-effectiveness analysis (CEA) to evaluate the net health benefits and costs of administering dengue vaccination to annual birth cohorts in SEA.

METHOD: We updated and improved a CEA model published in 1993 by two of the authors. The model was validated to the epidemiological and economic data for the SEA region, where 529 million people live. The target of the vaccination was the cohort of 12 million children born in SEA each year. We assumed 2 doses of vaccine would be required to provide lifetime protection with 95% efficacy. We also assumed a dose cost of $5. We compared the impact of vaccination against the current situation and against a comprehensive vector control program. We used a societal perspective and the cohort lifetime as the timeframe and discounted Disability Adjusted Life Years (DALYS) and economic outcomes at an annual real rate of 3%.

RESULTS: Providing vaccination to a birth cohort in SEA would cost $389 per QALY saved. A comprehensive environmental control program was less favorable ($5,000 per QALY gained).

CONCLUSIONS: Dengue vaccination appears to be a very cost-effective strategy to control dengue. This finding supports the need to accelerate the development and commercialization of an efficacious dengue vaccine.

ECONOMIC IMPACT OF RESPIRATORY SYNCYTIAL VIRUS INFECTION ON HEALTHCARE RESOURCE UTILIZATION AND COSTS IN THE UNITED STATES
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OBJECTIVES: To determine the impact of respiratory syncytial virus (RSV) infection on healthcare resource use and costs in the United States.

METHODS: The study retrospectively analyzed data from three separate, federally funded databases that comprise nationally representative samples of 1) hospital inpatient stays (1993–1997), 2) physician office visits (1997–1999), and 3) visits to hospital outpatient departments and emergency rooms (1997–1999). Each record in these databases contained information on patient diagnoses, tests and procedures performed during visit, and prescribed drugs (not available on inpatient records). Identification of RSV-related medical encounters was based on the occurrence of RSV-specific ICD-9-CM diagnosis codes (079.6, 466.11, 480.1) or the assumption that 20% of all otitis media visits (ICD-9-CM 380.0–380.4, 382.x) were due to RSV.

RESULTS: In 1997, there were approximately 87,400 hospitalizations, 5 million office visits, 749,000 emergency room visits and 494,000 hospital outpatient visits attributable to RSV. Nearly 99% of RSV-related hospitalizations occurred in children <5 years old. Average length of hospital stay for RSV-related bronchiolitis and pneumonia was 3.4 and 4.4 days, respectively. The estimated average charges for RSV-related utilization in 1997 were as follows: $8,839 per hospitalization, $114 per office visit, $473 per emergency room visit and $162 per hospital outpatient visit. Total annual costs for all RSV-related hospitalizations ($770 million) and physician visits ($1 billion) were estimated at $1.77 billion. Otitis media was the major cost driver for physician visits. Both RSV-related hospitalizations and total costs increased over the period of 1993–1997.

CONCLUSIONS: Treatment of RSV-related illness represents a significant health care burden in the US.

COST-EFFECTIVENESS OF VACCINATING ADULT CLOSE CONTACTS WITH BOOSTRIX®
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OBJECTIVES: Despite widespread childhood immunization, there is a resurgence of pertussis infections and resultant clinical sequelae as adults infect children who are too young to be fully vaccinated or whose immunity is waning. A reduced antigen dTpa booster pertussis vaccine
METHODS: A literature-based model was developed to quantify the clinical and economic costs and benefits of vaccinating parents with Boostrix following the birth of their first child. The model projected and compared the number of adult infections avoided in two hypothetical cohorts (one with and one without vaccination) of one million parent couples over 10 years. The model also quantified the number of pediatric infections avoided due to reduced infectivity of vaccinated parents.

RESULTS: Immunization with Boostrix led to the following projected discounted benefits: avoidance of 1,178 pediatric and 44,264 adult pertussis infections, 1.3 pediatric encephalopathy cases, 0.4 pediatric chronic brain damage cases, and 1.4 pediatric deaths. Vaccination led to reductions in direct medical interventions, valued at $15.2 million, and prevented lost productivity, valued at $28.9 million, for a total savings of $44.1 million. Including the cost of vaccination of $20.0 million ($10 per adult), the net discounted savings of vaccination was estimated at $24.1 million. The largest cost savings were due to adult outpatient cases avoided (78%) and total (adult and pediatric) hospital stays avoided (13%). The program amounts to a net savings of $12.07 per vaccinee. In univariate sensitivity analyses in which each model input was varied by ±25 percent, the net savings per vaccinee ranged from $5.14 to $18.99.

CONCLUSIONS: In this model, vaccinating young parents with Boostrix appears to be a cost-saving preventive measure. Driving this result is the large cost savings attributable to far fewer adult outpatient pertussis cases.

OBJECTIVES: The goal of this effort was to evaluate its cost-effectiveness.

RESULTS: Of the 1,968 RSV CAP inpatient cases identified, 58% were ≥65 years old. The mean length of stay was 5.6 days. The mean episode cost for those treated as inpatients was $13,187. Hospital-related costs comprised 75% ($9,939) of that cost. The typical cost of outpatient management was $550. On average, those treated initially as outpatients but subsequently hospitalized accrued $13,888 per person. The mean overall cost for an RSV-related CAP episode was $3,194.

CONCLUSIONS: RSV-related CAP cases managed as inpatients are substantially more costly. Initiatives to treat more patients as outpatients should lead to lowering the overall episode cost. These costs provide valuable inputs for economic analyses of viral CAP-related vaccines and treatments.