ECONOMIC IMPACT OF VACCINATION STRATEGIES AGAINST GROUP A *NEISSERIA MENINGITIDIS* (NMA) IN BURKINA FASO

MVP CLOSURE CONFERENCE
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AIM

- Estimate the economic impact of the introduction of MenAfriVac, a group A meningococcal conjugate vaccine, on households and health systems in countries of the African meningitis belt.
METHODS – KEY ELEMENTS

- Cost of Illness (CoI)
- Target population of the vaccination against NmA
- Societal perspective (households and health system)
- Analytical horizon of 26 years (2010 - 2035)
- Price level and currency: 2012 USD
- Full costing
- Comparator: reactive campaigns with the polysaccharide A+C vaccine (past strategy)
## VACCINATION STRATEGIES

<table>
<thead>
<tr>
<th>Vaccination strategy</th>
<th>WHO recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Past</strong></td>
<td></td>
</tr>
<tr>
<td>Reactive campaigns</td>
<td>Mass immunization of at risk population - once the epidemic threshold is reached</td>
</tr>
<tr>
<td><strong>Current (2010-2016)</strong></td>
<td></td>
</tr>
<tr>
<td>A. Initial preventive campaign only</td>
<td>Mass immunization of 1-29 year olds – preventive campaign with MenAfriVac</td>
</tr>
<tr>
<td>B. Periodic preventive campaigns</td>
<td>Periodic mass immunization of 1-4 year olds with MenAfriVac</td>
</tr>
<tr>
<td>C. Routine EPI</td>
<td>Routine EPI @ 9 months of age, 5 years after introduction with MenAfriVac</td>
</tr>
<tr>
<td>D. Combination</td>
<td>Routine EPI @ 9 months of age, 5 years after introduction plus a one off 1-4 year old catch-up campaign with MenAfriVac</td>
</tr>
</tbody>
</table>
METHODS – OVERVIEW OF THE COSTS

Health System

Vaccination
- Vaccines and injection material, Planning and coordination, Training, IEC/social mobilization, Supervision, Surveillance, Monitoring & evaluation, Waste management, HR per-diems and allowances

Case Management
- Medecines, consultations, hospitalisations

Households
- * Free care for households
  - No self medication
  - No traditional healer visits

Direct Non Medical Costs (DNMC)
- Transport, Foods, costs for visitors, phone calls to the family, personnel hygiene items

Indirect Costs (IC)
- Lenght of inactivity of patients and/or family caregiver

* Free care for households
* No self medication
* No traditional healer visits
METHODS – COSTS CALCULATION

Case management
- Nb NmA cases x Average cost

- DNMC
  - Nb NmA cases x Average cost

- IC
  - Length inactivity x daily GDP per capita
  - Duration of professional inactivity due to the illness = 21 days
  - Number of persons impeded to work in the households = 1

Vaccination
- At risk population
- Calculation
  - Future strategies (Routine and Catch Up)
    - Vaccine & injection material: Nb doses x average projected fully loaded price per dose
    - Operational costs: Nb doses x cost of delivery per dose
  - Preventive strategy: expenses or funds allocation
  - Reactive strategy: Nb cases x average costs per case
METHODS – DATA SOURCES

Programmatic documents

- Vaccines and delivery costs
  - Routine delivery: NIP CMYPs
  - Preventive campaigns: GAVI approvals and disbursements; countries applications to GAVI; countries campaigns reports
  - Reactive campaigns: *countries national plans for S&R against epidemics*

Peer reviewed literature

- DMC: from Colombini 2009 & Portnoy 2015
- DNMC ratio: Colombini 2009
- Reactive campaigns costs: Colombini 2011

Others

- Population projections: UNDP
- Yearly annual Incidence: C. Trotter model
- Forecast of vaccine doses & price for future strategies: Y. Madrid
  - Coverage: 80% for routine; 100% for campaigns
- IC: WB GDP projections
Savings are the difference of costs between the baseline comparator and each given strategy

Sensitivity analysis – Discounting of costs and cases
RESULTS IN BURKINA FASO
Costs of *Neisseria meningitidis* Group A Disease and Economic Impact of Vaccination in Burkina Faso

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**Background.** Five years since the successful introduction of MenAfriVac in a mass vaccination campaign targeting 1- to 29-year-olds in Burkina Faso, consideration must be given to the optimal strategies for sustaining population protection. This study aims to estimate the economic impact of a range of vaccination strategies in Burkina Faso.

**Methods.** We performed a cost-of-illness study, comparing different vaccination scenarios in terms of costs to both households and health systems over a 26-year time horizon. These scenarios are (1) reactive vaccination campaign (baseline comparator); (2) reactive vaccination campaign; (3) routine immunization at 6 months; and (4)
POPULATION AND NMA CASES, BURKINA FASO, 2010-2035

Total Population 2010: 15,995 Millions

At risk Population: 100%

Expected number of cumulated NmA cases:
- Reactive: 142,919
- Preventive: 85,216
- Preventive + Routine: 14,776
- Preventive + Combination: 3,066
RESULTS – COSTS AND SAVINGS OF CURRENT STRATEGY, 2010 - 2014

Economic Impact of preventive campaign with MenAfrivac, 2010-2014

- Reactive campaigns
  - Costs vaccinination: 2.6
  - Costs case management: 0.6
  - Costs indirect: 0.6
  - Total costs: 3.8

- Preventive campaigns
  - Costs vaccinination: 9.7
  - Costs case management: 2.6
  - Costs indirect: 0.6
  - Total costs: 12.9

Costs Saved: +0.3 Millions USD
### RESULTS – COSTS OF FUTURE STRATEGIES 2015-2035

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Nb cases NmA</th>
<th>Case management</th>
<th>Vaccination</th>
<th>DNMC</th>
<th>IC</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactive</td>
<td>122,466</td>
<td>6,212,720</td>
<td>34,063,283</td>
<td>3,806,212</td>
<td>15,865,184</td>
<td>59,947,398</td>
</tr>
<tr>
<td>Routine</td>
<td>14,776</td>
<td>749,577</td>
<td>24,282,338</td>
<td>459,227</td>
<td>1,914,166</td>
<td>27,405,308</td>
</tr>
<tr>
<td>Routine + Catch-Up</td>
<td>3,066</td>
<td>155,550</td>
<td>27,000,288</td>
<td>95,298</td>
<td>397,223</td>
<td>27,648,358</td>
</tr>
</tbody>
</table>
RESULTS – TOTAL SAVINGS OF FUTURE STRATEGIES 2015-2035

<table>
<thead>
<tr>
<th></th>
<th>Millions USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine</td>
<td>32.5</td>
</tr>
<tr>
<td>Routine + Catch-Up</td>
<td>32.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Nb Cases averted</th>
<th>RoI (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine</td>
<td>107 690</td>
<td>1,3</td>
</tr>
<tr>
<td>Routine + Catch-Up</td>
<td>119 400</td>
<td>1,2</td>
</tr>
</tbody>
</table>
RESULTS – SAVINGS OF FUTURE STRATEGIES PER TYPE OF COSTS
2015 - 2035

<table>
<thead>
<tr>
<th></th>
<th>Routine strategy 2015-2035</th>
<th>Combination strategy 2015-2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect costs</td>
<td>13,951,018</td>
<td>15,467,961</td>
</tr>
<tr>
<td>Direct Non Medical Costs</td>
<td>3,346,985</td>
<td>3,710,914</td>
</tr>
<tr>
<td>Vaccination</td>
<td>9,780,945</td>
<td>7,062,995</td>
</tr>
<tr>
<td>Case management</td>
<td>5,463,143</td>
<td>6,057,170</td>
</tr>
</tbody>
</table>

Households:
- Indirect costs: 3.3 million USD
- Direct Non Medical Costs: 9.8 million USD
- Vaccination: 5.5 million USD
- Case management: 6.1 million USD
All the strategies remains cost savings compared to the reactive strategy
  • when costs are discounted at 3%
  • when discounting both costs and cases at 3%, except the short term strategy of preventive vaccination campaign (2010-2014)

Need further sensitivity analysis on the conservative hypotheses - savings are expected to be even higher (sequelae, DMC and IC)
All preventive strategies save money

Households are the primary beneficiaries of all these strategies from an economic perspective also

Health systems are also benefiting from all strategies
  • Vaccination costs: except the short term strategy of preventive vaccination campaign alone
  • Case management costs: always
  • Disruption of health centres

(results without discounting)
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