Use of cholera vaccines in countries: progress and challenges

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Dr Pem Namgyal, IVR
Cholera cases reported to WHO, 1989-2009

Source: WER 31, 2010; 85: 293-308
## Reported cholera cases & deaths, worldwide, 2010 (*provisional only*)

<table>
<thead>
<tr>
<th>Country</th>
<th>Cholera cases</th>
<th>Cholera deaths</th>
<th>Case fatality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haiti</td>
<td>121,518</td>
<td>2,591</td>
<td>2.1</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>399</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>USA</td>
<td>13</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Pakistan</td>
<td>99</td>
<td>?</td>
<td>NA</td>
</tr>
<tr>
<td>Chad</td>
<td>2,508</td>
<td>111</td>
<td>4.4</td>
</tr>
<tr>
<td>Cameroon</td>
<td>7,869</td>
<td>515</td>
<td>6.5</td>
</tr>
<tr>
<td>Niger</td>
<td>976</td>
<td>62</td>
<td>6.4</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>870</td>
<td>32</td>
<td>3.7</td>
</tr>
<tr>
<td>Nigeria</td>
<td>29,115</td>
<td>1,191</td>
<td>4.1</td>
</tr>
</tbody>
</table>
Past use of oral cholera vaccine

- In 1997, in a refugee setting in Uganda a cholera vaccination campaign was carried out where 63,220 doses of vaccine were administered to assess the feasibility of vaccination in such a setting and showing that it was feasible [1]
- In 2003/2004, in Beira, Mozambique, cholera vaccination was carried out targeting 19,550 people to evaluate vaccine protection in an endemic setting; demonstrating significant protection 78% [2]
- Following the tsunami in Aceh, Indonesia, from April to August 2005, 78,870 at risk people were targeted for a preventive cholera vaccination campaign, achieving 69% coverage
Cholera vaccine use...2/

- More recent use of cholera vaccine:
  - The only country where cholera vaccine is reported to be used routinely is in Viet Nam; in one province-Hue. In 2010, a total of 149,038 doses were administered in a 2-dose schedule for 2-yr old children.
  - It is also only in Viet Nam, in 2008, where cholera vaccine was used in two districts in Hanoi during an outbreak of cholera.

- Cholera vaccine use in research settings
  - The ongoing Kolkata Shanchol study
  - In 2009, a study in a rural and an urban setting in Zanzibar where cholera is endemic was carried out to assess feasibility and vaccine efficacy in such a setting.
    - It targeted 51,151 population at risk for the vaccination; receipt of one or more doses of rBS-WC was associated with a 62% (95% CI, 7 to 85; P < 0.03) and 77% (95% CI, 30 to 93; P < 0.01) [unpublished data].

- The extent of use of cholera vaccines in the private sector is unknown.
Recent cholera outbreaks

In recent times there has been several outbreaks of cholera, and discussions on the role of vaccines have surfaced without it actually ever taking place

- **Zimbabwe**, outbreak started in 2008, cholera has spread to the whole country and, as of May 2009, 98,424 suspected cases, including 4,276 deaths (Case Fatality Rate of 4.3%) have been reported.

- **Papua New Guinea**, starting in 2009, cholera outbreak has continued to spread to other parts of the country, and by June 2010, 5,039 cases including 79 deaths (case fatality rate of 1.57%) in 7 provinces were reported.

- Most recent outbreak of cholera is of **Haiti**, which will be presented separately and in greater detail

- The outbreak of cholera in **Pakistan** is an example of the complex nature of response to an outbreak, particularly when set against the backdrop of immense humanitarian & emergency situation
Pakistan floods, an example of the complex issues around cholera vaccine deployment in crisis situations

Pakistan - the situation
- In late July 2010, following heavy monsoon rains, the Indus breached its banks causing extensive flooding
- The flood affected more than 20 million people, displacing millions and causing devastating destruction to infrastructure such as water supplies, roads, railways, health facilities etc..
- Acute watery diarrhoea was one of the commonest causes for seeking help. Most believed that a substantial proportion of that AWD was cholera
- This was confirmed subsequently
- Discussion on possible role of vaccines began, but went no where

Stated reasons that cholera vaccination was considered an inappropriate response
- Large number of displaced people, constantly moving - difficult to define target
- Many important priorities such as food, clean water, acute care etc.. in the aftermath of the disaster - implication on the time and human resources needed to mount a reasonable campaign
- Disruptions in the transport infrastructure, available resources strained to the limit - difficult to organize campaigns across entire affected areas
- Limited supplies of vaccine and that too not immediately available
The different epidemiologic settings of cholera

- There are clearly two different settings where cholera outbreaks continue to occur:
  - In an emergency humanitarian disaster situation, and
  - In an endemic setting where cholera occurs on a regular basis
  - Each of the above epidemiologic situation requires a different approach to deal with cholera outbreaks

- In an epidemic or humanitarian disaster situation, there are many other pressing needs and, therefore, benefits of vaccine deployment need to be assessed against other priorities.
  - This is an area that requires further analysis and deliberations
  - However, in Viet Nam, cholera vaccine was used in an outbreak and subsequent evaluation showed significant protection even in such situation [3]

The control of cholera in an endemic setting

In an endemic setting, there is clearly a place for vaccines to complement other cholera control measures.

- Modelling projection [4], shows that a brisk response at the start of the outbreak that would have immunized 50% of the population would have prevented 40% of subsequent cases and deaths.
- Where cholera is endemic, countries need support to plan and implement regular cholera vaccination programmes, and assist to monitor the impact of vaccination.
- Cholera outbreak response preparedness plans are needed.
- Intensified effort to reach policy makers and public health persons on the front line with clear communication on the benefits of vaccines and vaccination for cholera as a complementary intervention to efforts improve water and sanitation and living condition of affected population.

Some of the challenges and the way forward..1/

- The single WHO prequalified cholera vaccine in limited quantities is a major obstacle to a rapid and effective response when the need for vaccines is sudden and huge
  - Need to invest to increase capacity, and for manufacturers to strive for WHO prequalification are priorities

- New initiatives to move the cholera agenda forward
  - WHA64 Resolution on cholera control, in May 2011,
  - Working Group on Vaccines in Emergencies,
    - SAGE Working Group to examine the role of vaccines in emergencies- cholera expected to be an important component of this group's work
Some of the challenges and the way forward...

- The potential benefits of a cholera vaccine stockpile
  - Vaccine stockpiles have been successful to address other vaccine preventable diseases with epidemic potential, e.g. YF, Meninge A, polio etc.
  - For cholera control, a vaccine stockpile may serve as a 'gateway' to address both routine immunization as well as the sudden demand in 'crisis' situation:
    - If several countries initiate routine vaccination, a stockpile is not the solution to the vaccine demand, but it would be a starting point, i.e. as the 'gateway' to building a sustainable programme
    - In sudden epidemics in crisis situations, a stockpile provides immediate availability of vaccines to move fast and effectively to curtail outbreaks in its early phase
THANK YOU