Advocacy for Vaccine in LMICs: Focusing on typhoid

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Starting editing from here

Samir K Saha, 1/31/2019
Why Advocacy and Why we have a dedicated session for this?

- Features of vaccine prevented/eliminated devastating diseases are forgotten
  - Small Pox, Polio, tetanus, Hib disease, etc
    - Mostly true for developed countries

- We are now ambitious
  - Do not want to wait for 20+ years
  - PCV10/13 came to LMIC with 2 years of being in developed country

- Strategy of advocacy needs to the changed as world is changing
The World is Changing!

WHY LOW MIDDLE INCOME COUNTRIES (LMIC)?
Growth of the Low Income/Emerging Countries

World Real GDP Growth

- 2014
- 2015
- 2016

<table>
<thead>
<tr>
<th>World</th>
<th>Emerging markets</th>
<th>Advanced economies</th>
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<tbody>
<tr>
<td>4.5</td>
<td>3.3</td>
<td>1.9</td>
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Just keeping the head above the water to show the GDP status

Great for politicians
Challenge to get Gavi support for live saving for vaccine
SKS5  Need to remake this slide for animation
Samir K Saha, 2/6/2019

SKS6  Can we find an updates slide on this?
Samir K Saha, 2/6/2019
Impact of GDP on Vaccine Uptake

Why Low Middle Income Countries (LMIC)?

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Why Low Middle Income Countries (LMIC)?

Advocacy then and now

LMICS ARE CHANGING DUE TO THE DECLINE OF CHILD MORTALITY
Advocacy then and now

THE MAIN ADVOCACY TOOLS WERE DEATHS AND DISABILITIES
Our Days in the Laboratory in 1980s

- Diphtheria cases everyday
- Tetanus was not uncommon
- Pneumococcus and Hib diseases were many though only few laboratories could detect them
Introduction of vaccines

SIGNIFICANT DECLINE IN MORTALITY. MORE SPECIFICALLY ....
Country-specific mortality rates and deaths attributable to Pneumococcus and Hib in 2015

- Two vaccines have saved 1.45 million children’s lives in the last 15 years

Wahl et al Lancet Glob Hlth 2018
Over all Decline in Child Mortality

Levels and Trends in Child Mortality, WHO 2018
What are the barriers to Typhoid Vaccine Introduction

WE ARE STILL LOOKING FOR DEATHS, SEVERITIES AND COMPLICATIONS!!
THE WORLD IS CHANGING – SPECIFICALLY THE DEVELOPING WORLD

<table>
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<th>MDG</th>
<th>SDG</th>
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<td>1990</td>
<td>12.7 million</td>
<td>Aiming to achieve “Good Health and Wellbeing” SDG 3</td>
</tr>
<tr>
<td>2015 (MDG 4)</td>
<td>5.9 million</td>
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Levels and Trends in Child Mortality, WHO 2015
Typhoid does not with either. It is important we consider the health system implications. Otherwise deaths will be in a Plato, despite the prevention high mortality diseases

**DEATHS ARE USED AS THE TOOL AND SOMETIMES DISABILITIES**
Bangladesh - Most of the causes of <5 deaths are declining – remarkably diarrhoea

Under 5 Deaths per 1,000 live births

- Pneumonia: 12 to 18, decrease of 37%
- Birth asphyxia: 7 to 13, decrease of 51%
- Diarrhoea: 7 to 1, decrease of 85%
- Drowning: 3 to 5, decrease of 33%
- Other neonatal: 3 to 6
- Other causes (including injury): 3 to 4
- Prematurity/LBW: 4 to 5
- Possible serious Infection: 8 to 20, increase of 60%
- Unspecific/Undetermined: 10 to 14

Bangladesh Demographic and Health Surveys, 2004 & 2011
Disappointing to see that we are only talking about death not the well beings
Samir K Saha, 2/6/2019

We need to calculate the deaths in LMICs
Samir K Saha, 2/8/2019
Proportion of <5 death due to Pneumonia and Diarrhea in Bangladesh

May be not required
Samir K Saha, 2/6/2019
Possible hesitancy among the policy makers – Why?

• Minimal or no deaths among the Typhoid cases
  – 0.05% (3/6136)

• Advocates need to find a strategies to convince the policy makers and help them to make the right decision(s)

• All needs to be done with evidences → Data

• It should be simpler than Hib and Pneumococcal diseases
  – Few blood culture positive cases
  – Clinical signs were non-specific
    • Diverse aetiology of Pneumonia
  – We had to have vaccine probe studies and so on
Possible challenge of introducing a new vaccine like Typhoid
Samir K Saha, 2/6/2019
WE CAN EXPLORE THE BURDEN OF DISEASES AT HOSPITALS (OPD & IPD) AND POSSIBLE IMPACT ON “HEALTH SYSTEM”
Admission at Dhaka Shishu Hospital (N=23,064) – the largest pediatric hospital (2017)

- In 2017 to 23,000 admission, 15% of them are pneumonia
- Typhoid is only 3%
- Based on such data, vaccines against pneumonia and meningitis have rightly been prioritized.
- However, .......

Percentage

- Pneumonia
- Severe perinatal asphyxia
- Acute gastroenteritis
- Pre-term low birth weight
- Neonatal sepsis
- Bronchiolitis
- Febrile convulsion
- Sepsis
- Neonatal jaundice
- Enteric fever
- Meningitis
- Nephrotic syndrome
- Severe pneumonia
Typhoid – Microbiologically Strong:
Invasive bacterial disease surveillance

Number of blood cultures (17,511) (age >2months)
– 1355 S. Typhi
– 72% of all isolates

Predominance of S. Typhi
– True for other hospitals
Consider Hospital Stay of Typhoid Cases

Fierce competition for beds in public hospitals. In Bangladesh we have only 3 beds per 10,000 population, in comparison to 31 in the US. This leads to refusal of cases that require hospitalization. We hypothesize that refused cases are more vulnerable to death and disability.
Competition for Bed and Impact on Health System

- Bed Occupancy by Typhoid Cases
  - Average hospital stay – 6 days (3 - 7 days)
  - 15 to 30 beds are occupied by enteric fever cases.
Impact of typhoid on the health system - possible impact of vaccine

- Fierce competition for beds in public hospitals
- At Resource poor setting, only 3 beds per 10,000 population, in comparison to 31 in the US
- This leading to refusal of cases, just by putting a stamp
  - “BED NOT AVAILABLE”
  - Huge burden on Health System
- In 2017 to 6000 admissible cases were refused
- A huge burden on the “Health System”
- Refused cases are more severe and vulnerable to deaths and disabilities
  - Care seeking issues

Saha et al Am J Trop Med Hyg, 2018
One Step Further

- Consultation time
  - Ranged from 48 sec to 22 mins
    - Typhoid is the most common diagnosis at OPD and private clinics
  - Patients will get more time if we can prevent typhoid

BMJ Open November 2017; 7(10): e017902
Consider the AMR issues – It can be advocacy tool too!

**TCV INTRODUCED IN PAKISTAN TO PREVENT THE SPREAD OF XDR**
Rise in Antimicrobial resistance in *Salmonella* Typhi - Are we heading to Pre-antibiotic era?

- Typhoid Deaths in Pre-antibiotic Era
  - 1545 Mexico -> more than 7 million
  - 1870 German -> 7000
  - 1935 Italy-Ethiopia war -> 20000 (Ethiopia)

Andrews J et al. NEJM 2018

Emergence of Azith<sup>R</sup> Saha et al unpublished
Advocacy – “Do” and “Do Not”

**Do**
- Generate Data
- Show the data in a simple way
- Bring Human face of Typhoid cases
- Talk about Health System
- Talk from your heart
  - Better if you have local champion who contributed in generating the data

**Do Not**
- Don’t talk about complex adjustments
- Don’t try to be a champion for all vaccines
- Don’t do advocacy for multiple vaccines at a time
- Do not make any unrealistic commitments
Advocacy amplifies voices – However, it may counteract too!

Talk From Your Heart
THANK YOU!

Policy makers

Clinicians

Laboratory Personnel