CONTROL AND PREVENTION OF ENTERIC FEVER:

POLICY AND PRACTICE IN WHO SEARO

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8th International Conference on Typhoid fever

And Other Invasive Salmonelloses

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WHO Position paper on typhoid vaccines in the year 2000

- REPLACEMENT OF THE OLD INACTIVETED WHOLE CELL TYPHOID VACCINE WITH NEW GENERATION Vi or Ty21A VACCINE
- IMMUNISATION OF SCHOOL AGED CHILDREN AND YOUNG ADULTS WHERE TYPHOID AND/OR ANTIBIOTIC RESISTANCE IS A SIGNIFICANT PROBLEM
- VACCINATION OF TRAVELERS TO HIGHLY ENDEMIC AREAS.

WHO Position paper on typhoid vaccines in the year 2000

- The year 2000 PP did not however provide guidance on:-
- programme goals,
- time frame,
- delivery strategies such as routine vaccination vs mass campaigns and vaccination of single cohorts vs catch up of older groups.
- **THE RECOMMENDATIONS WENT LARGELY UNHEEDED EXCEPT BY CHINA, INDIA AND VIETNAM.**

2007 Typhoid Immunisation Group Presents Background Paper to SAGE

- Among other factors:-

  evidence presented from Population based Surveillance studies in FIVE Asian countries conducted under the DOMI- programme of the Bill and Melinda Gates Foundation.

- The five Asian sites:-
- North Jakarta, Indonesia; 140/100,000
- Karachi Pakistan, 573/100,00
- Hechi, China
- Vietnam
- Kolkata, India. 340/100,000

Pre school children included in Karachi, Kolkota and N.Jakarta . Showed that school aged children were at particular high risk and that in highly endemic areas,toddlers and pre-school children were at a comparable risk.

- **Incidence rates of more than 100/100,000 population are considered high.**

- An estimated **21 million cases of typhoid** occurred world wide annually with about **216,000 deaths**.
- Furthermore that **90% of these deaths occurred in Asia.**
- There was Increasing **multidrug resistance**.
- Case fatality was 1-4% including treated patients but could climb to 10-20% if left untreated.
- An estimated **1-5 % of survivors became long term gall bladder carriers** who carried the risk of developing hepatobiliary cancer.

WHO published a revised Position Paper on Typhoid Vaccines in 2008.

WER, No. 6 2008, 83, 49-60

2008 PP

- **COUNTRIES SHOULD CONSIDER THE PROGRAMMATIC USE OF TYPHOID VACCINES FOR CONTROLLING ENDEMIC DISEASE. IN MOST COUNTRIES,**
- **THE CONTROL OF THE DISEASE WILL REQUIRE VACCINATION OF HIGH RISK GROUPS AND POPULATIONS.**
- **GIVEN THE EPIDEMIC POTENTIAL OF TYPHOID FEVER AND OBSERVATIONS ON THE EFFECTIVENESS OF VACCINATION IN INTERRUPTING OUTBREAKS, TYPHOID FEVER VACCINATION IS RECOMMENDED ALSO FOR OUTBREAK CONTROL.**
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2008 PP

- **DECISIONS :-**
- **KNOWLEDGE OF THE LOCAL EPIDEMIOLOGICAL SITUATION.**
- **DATA ON SUBPOPULATIONS AT PARTICULAR RISK AND AGE SPECIFIC INCIDENCE RATES,**
- **SENSITIVITY OF THE PREVAILING S.TYPHI STRAINS TO RELEVANT ANTIMICROBIAL DRUGS.**
- **IDEALLY, COSTEFFECTIVENESS ANALYSES SHOULD BE PART OF THE PLANNING PROCESS.**

2008 PP

- **THE SELECTION OF DELIVERY STRATEGY (SCHOOL OR COMMUNITY BASED VACCINATION) DEPENDS ON FACTORS TO BE DECIDED BY THE CONCERNED COUNTRIES.**

- **THE AGE SPECIFIC INCIDENCE OF DISEASE,**

- **SUBGROUPS AT PARTICULAR RISK**

- **SCHOOL ENROLEMENT RATES,**

2008 PP

- **TYPHOID FEVER VACCINATION MAY BE OFFERED TO TRAVELLERS**
- **All typhoid fever vaccination programmes should be implemented in the context of other efforts to control the disease, including :-**
- **HEALTH EDUCATION,**
- **WATER QUALITY AND SANITATION IMPROVEMENTS,**
- **TRAINING OF HEALTH PROFESSIONALS IN DIAGNOSIS AND TREATMENT.**

SEARO ITAG RECOMMENDATION

- **RECOGNISING THAT TYPHOID FEVER MAY BE A SIGNIFICANT CAUSE OF MORBIDITY AND MORTALITY IN THE REGION, THE ITAG ENCOURAGES COUNTRIES TO IDENTIFY THEIR DISEASE BURDEN AND AT RISK POPULATION IN ORDER TO CONSIDER VACCINE INTRODUCTION AS PART OF A COMPREHENSIVE DISEASE CONTROL PROGRAMME.**
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The workshop members prioritized vaccines for consideration of introduction in the region, and categorized them into three categories (short term, r

DECISIONS AT A RECENT SEARO MEETING ON NEW AND UNDERUTILISED VACCINES

1. Immediate priority list (for consideration of introduction in next 2-3 years)	Rubella, Hib, conjugate pneumococcal, typhoid, seasonal influenza, rotavirus, cholera
2 In the near future (for consideration of introduction in 5-10 years)	Mumps, new and improved JE vaccines, human papillomavirus, rabies, Hepatitis A, meningococcal vaccine (against meningococcus A)
3 Distant future (for consideration of introduction in 10 years)	HIV, IPV, Dengue, Hepatitis E, tuberculosis

- Countries were advised that decisions to introduce vaccines should be guided by
- Disease burden (incidence/prevalence, absolute number of morbidity/mortality, epidemic/pandemic potential
- Efficacy of vaccine in consideration
- Safety of the vaccine
- Affordability (financial sustainability)
- Programme capacity to introduce new antigens, including cold chain capacity
- Availability of domestic or regional vaccine production capacity
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- **SUGGESTED RESOLUTION**

- **THE SEA REGION WHICH HAS THE HEAVIEST BUDEN OF DEATHS FROM ENTERIC FEVER SHOULD CONSIDER TYPHOID AS A DISEASE THAT CAN BE ELIMINATED FROM THE REGION.**
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ELEVEN COUNTRIES IN THE SEAR OF WHO

India
Bangladesh
Myanmar
Nepal
Sri Lanka
Bhutan
Thailand
Indonesia
Timor Leste
Maldives
DPR Korea

THAILAND

- 1970s and 80s Thailand launched a typhoid control programme using the old killed whole cell vaccine.
- the programme was combined with a programme on safe water and good sanitation.
- Typhoid was successfully controlled, and has not re-emerged..
- The use of the whole cell vaccine was abandoned in 1990 because of its reactogenicity.

NEPAL

- Typhoid fever is a leading cause of hospital admission among children, adolescents, and young adults presenting with fever in Nepal.
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INDIA

India is a highly typhoid endemic country, and may be having the highest absolute number of typhoid cases in the world.

In some regions, the incidence is as high as 1000/100,000 population.

Unfortunately, there is no national representative data and there is marked variation in the incidence at different geographical regions.

The Indian Academy of Paediatrics (IAP), the largest organization of paediatricians in the country has recommended 'immediate' inclusion of the typhoid vaccine in to national immunization.

INDONESIA

- **“current surveillance data estimates between 600,000-1.3 million cases of typhoid in Indonesia. each year, causing 20,000 deaths. uneven case reporting..**
- **A recent surveillance study conducted in two sub districts of North Jakarta found extremely high incidence rates among children aged 6-14 years (486/100,000), and that nearly 20% of cases required hospitalization for an average of 7 days.**
- **While typhoid vaccine was included in the 2011 schedule of recommended vaccines by the Indonesian Paediatric Association (IPA), typhoid vaccination has not yet been widely implemented. and the Indonesian Technical Advisory group (NITAG) has yet to make a recommendation regarding the use of typhoid vaccine.”**

BANGLADESH

- Typhoid fever is a leading cause of vaccine preventable disease in Bangladesh.

- While case management can be effective, half of typhoid cases are resistant to commonly used antibiotics leading to a case fatality rates as high as 30% in some settings

- The prevalence of S paratyphi A is increasing

- Other countries such as Sri Lanka and China too have experienced an increase in the prevalence of S paratyphi A.

- There are many vaccines in the pipeline, and one that immunizes against both S typhi and paratyphi A would be ideal for the control of enteric fever.

THE SEA REGION WHICH HAS THE HEAVIEST BURDEN OF DEATHS FROM ENTERIC FEVER SHOULD CONSIDER TYPHOID AS A DISEASE THAT CAN BE ELIMINATED FROM THE REGION.

WHO SEAR POLICY REGARDING TYPHOIDVACCINATION

SAME AS EXPLAINED IN THE WHO POSITION PAPER OF 2008 ON TYPHOID VACCINATION

Weekly Epidemiological Review No. 6, 2008, 83, 49-60

Policy

- **Countries to consider pragmatic use of Typhoid Vaccine**

- **May be through vaccination of high risk groups and for the control of outbreaks**

- Decision for programmatic use should be based on:-
  - **Disease burden studies**
  - **Subpopulations at particular risk**
  - **Age specific incidence**
  - **Antibiotic sensitivity of strains**
  - **Cost effective studies**

Policy (cont)

- **Immunisation of school age and / or pre-school age is recommended if Typhoid fever in these age groups is a serious public health problem and particularly where antibiotic resistant S typhi is prevalent**

Policy (contd)

- Delivery strategy – whether **school based or community based** should depend on:-
  - **Age specific incidence of disease**
  - **Subgroup at particular risk**
  - **School enrolment rate**
  - **Affordability of vaccine**
  - **Logistics e.g.**
    - **Cold chain facilities**
    - **Vaccine packaging**
    - **Human resources**

Policy (contd)

- **TRAVELERS to high endemic areas especially where antibiotic resistance is high should be offered vaccination**
- **Vaccination programmes should be offered in the context of other control measures:-**
  - **Health education**
  - **Provision of safe water**
  - **Sanitation improvements**
  - **Strengthening diagnostic and treatment facilities**

Justification

- Persisting disease burden – in many sites much above the incidence of 100 per 100,000 which is considered high.
- Economic burden
- Increasing antibiotic resistance
- Availability of effective and safe vaccines which are progressively becoming more affordable
- The fact that in most endemic countries, safe water and good sanitation is a goal achievable only in the long term

THANK YOU

DOMI study un 5 Asian countries

Annual incidence rates

100/100,000 is considered high

5-15 year age group 180-494/100,000 in the urban slums of North Jakarta, Kolkata and Karachi

Below 5 year age group –

574/100,000 – Karachi

340/100,000 - Kolkata

149/100,000 - N.Jakarta

- **Prior to DOMI study, disease surveillance in some other countries in the 1980s**

- **Santiago Chile** **100-230/100,000**
- **South Africa** **440/100,000**
- **Nepal** **810/100,000**

- DOMI study
- Antibiotic resistance
- 66% isolates in Karachi MDR i.e. Resistant to chloramphenicol, ampicillin and co-tromoxasole
- Resistance to fluoroquinolones
  - 60% Kolkata
  - 60% Karachi
  - 44% Hue Vietnam
  - 100% Mekong delta Vietnam

DOMI study

Average cost of typhoid illness

$15-182 for all cases

$ 129-$810 for hospitalised cases

Detailed analysis available in SAGE working group study of 2007

DOMI study

Social Behaviour

In the countries studied-

- **Recognised as a distinct disease entity**
- **Perceived as a serious problem**
- **Considerable population demand for vaccination**

DOMI study

Cost effectiveness studies of Vi polysaccharide vaccination in high risk population

Vaccination of school aged children and pre-school children was very cost effective in the slums of Kolkata, Karachi, and N Jakarta