Typhoid Fever in Samoa

A Burden of Disease Assessment

8th International Conference on Typhoid Fever & other Invasive Salmonelloses

1st -2nd March 2013,Pan Pacific Sonargaon
Dhaka, Bangladesh

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Ministry of Health
Samoa

Independent State of Samoa
(Country Brief)

- Total Population : ~ 200 000 (2011 Census)
- Land mass : 2,934 sq.km
- Consist of

  2 main islands : Upolu & Savaii

  2 smaller islands Apolima & Manono

  5 uninhabited islets
- Land is volcanic with mountainous interiors,

  coastal plains where the majority of the population reside

- Tropical climate: rainy season from Nov.- April
- Nearly ¾ of population reside on Upolu with a significant concentration around the capital of Apia
- Life Exp. at birth is 68 yrs for males,

  70 yrs for females.

Healthcare Service Providers

- National Health Service (NHS)

2 main hospitals:

Tupua Tamasese Meaole(TTM Hosp.-Upolu)

Malietoa Tanumafili II (MT II hosp.- Savaii)

4 district-level hospitals

8 health centres

only TTM & MT II are staffed by doctors,

rest are by nurses (appr. Referral System)

- 1 Doctor: 2,442 local inhabitants,
- 1 Nurse : 746 inhabitants

SITUATIONAL ANALYSIS

- *Demographic Issues :Urbanisation,*
  Aging Population.
- *Political issues: IHR,WTA,Legislation,SDS*
- *Changing Disease Patterns: NCDs,EID ,Re-EID*
- *Health Service Delivery Issues:*
  HIS, Surv.Syst, Prev. & Curative Care,
- *Health Work force issues : spec.training, pay,*
  short staff

National Strategy for the Development of Samoa(SDS) 2008 – 2012

- Vision : **"Improved Quality of Life for All"**
- set out through seven national development goals,
- fall under the three priority areas:

➢ economic policies,

➢ social polices

➢ public sector management and environmental sustainability.

National Strategy for the Development of Samoa(SDS) 2012 – 2015

- **Priority Area 1: Economic Policies**
  Goal 1: Sustained Macroeconomic Stability
  Goal 2: Private Sector Led Economic Growth and Employment Creation
- **Priority Area 2: Social Policies**
  Goal 3: Improved Education Outcomes
  Goal 4: Improved Health Outcomes
  Goal 5: Community Development: Improved Economic and Social Wellbeing and Improved Village Governance
- **Priority Area 3: Public Sector Management and Environmental Sustainability**
  Goal 6: Improved Governance
  Goal 7: Environmental Sustainability and Disaster Risk Reduction.

Typhoid in Samoa
Burden of Disease Assessment

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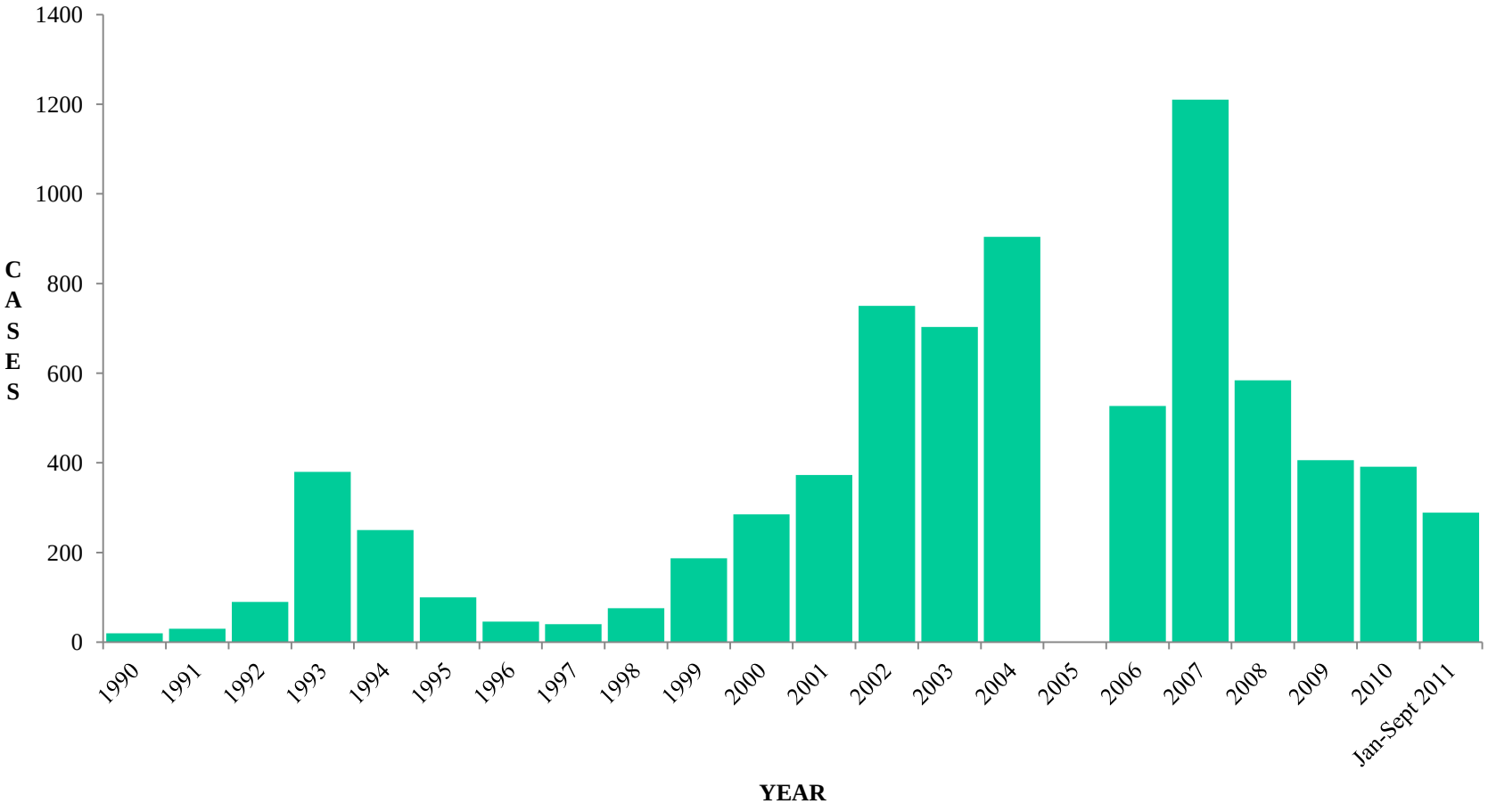
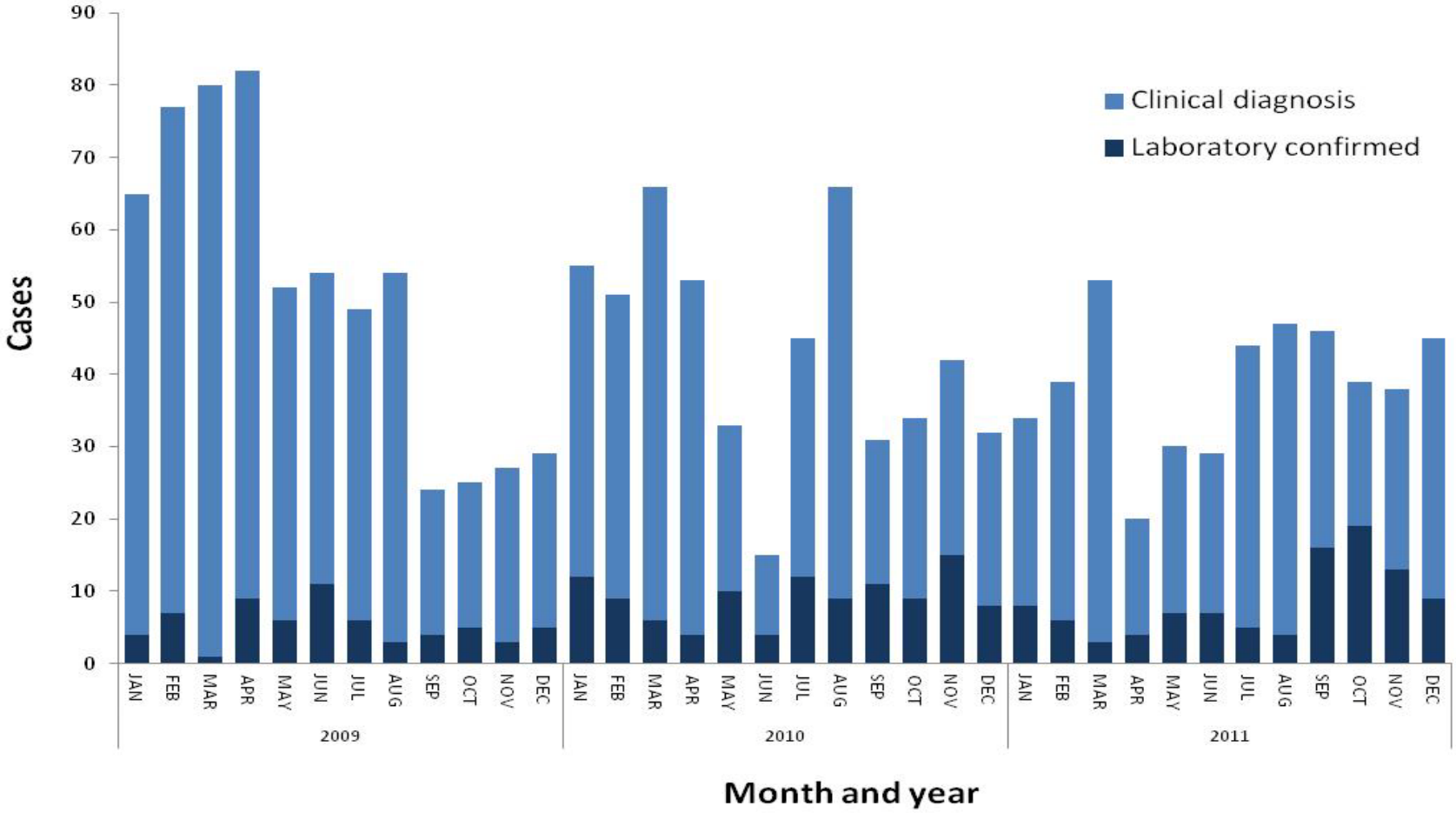
Clinical Features

- Variable clinical picture!
  - From very mild to very severe
  - Clinical diagnosis is very difficult
  - 60-90% do not get medical attention or are treated as outpatients
  - Young patients (<4) are often atypical, but highest case-fatality

Clinical typhoid fever cases Samoa, 1993- 2011



Typhoid fever cases Samoa, 2009-11



Rationale

- Despite ongoing control and prevention activities by the Samoa MOH, typhoid remains a serious public health threat
- Discussion between MOH and WHO on typhoid vaccination and control options
- First step: Need to systematically assess and describe the burden of typhoid
  - Inform optimal control strategies
  - Provide evidence for resource mobilization
  - Establish baseline for monitoring and evaluation

Assessment goal

To provide information for decision makers on the typhoid burden of disease in Samoa

Specific Objectives

Objective 1:

- To provide a **reliable estimate of the typhoid fever burden of disease** in Samoa, and describe the epidemiology, using available laboratory and clinical data.

Objective 2:

- Review, propose, and help initiate, as feasible, **typhoid fever control strategies**, including, potentially, **vaccination** programs.

Typhoid burden of disease assessment

Methods

- Analyzed blood culture and clinical data for 12 month period
  - 1 July 2010 – 30 June 2011
- Developed a typhoid burden of disease model
  - Blood culture data
  - Hospitalization data
  - Rapid assessment tool data

Typhoid burden of disease assessment

Results

Disease burden assessment tool	Preliminary estimated cases	Sensitivity analysis adjustment factor (range)	Projected total cases			Projected cases per 100,000		
			Total	Lower limit	Upper limit	Total	Lower limit	Upper limit
Blood culture	212	1.5 (1.0-2.0)	318	212	424	171	114	228
Typhoid Rapid Assessment Tool	593	1.0 (0.5-2.0)	593	297	1186	319	159	638
Hospital incidence rate*	73	6.25 (2.5-10.0)	456	183	730	321	129	514
Final combined estimates			**456**	**230**	**780**	**270**	**134**	**460**

** Date from Upolu only*

Typhoid burden of disease assessment

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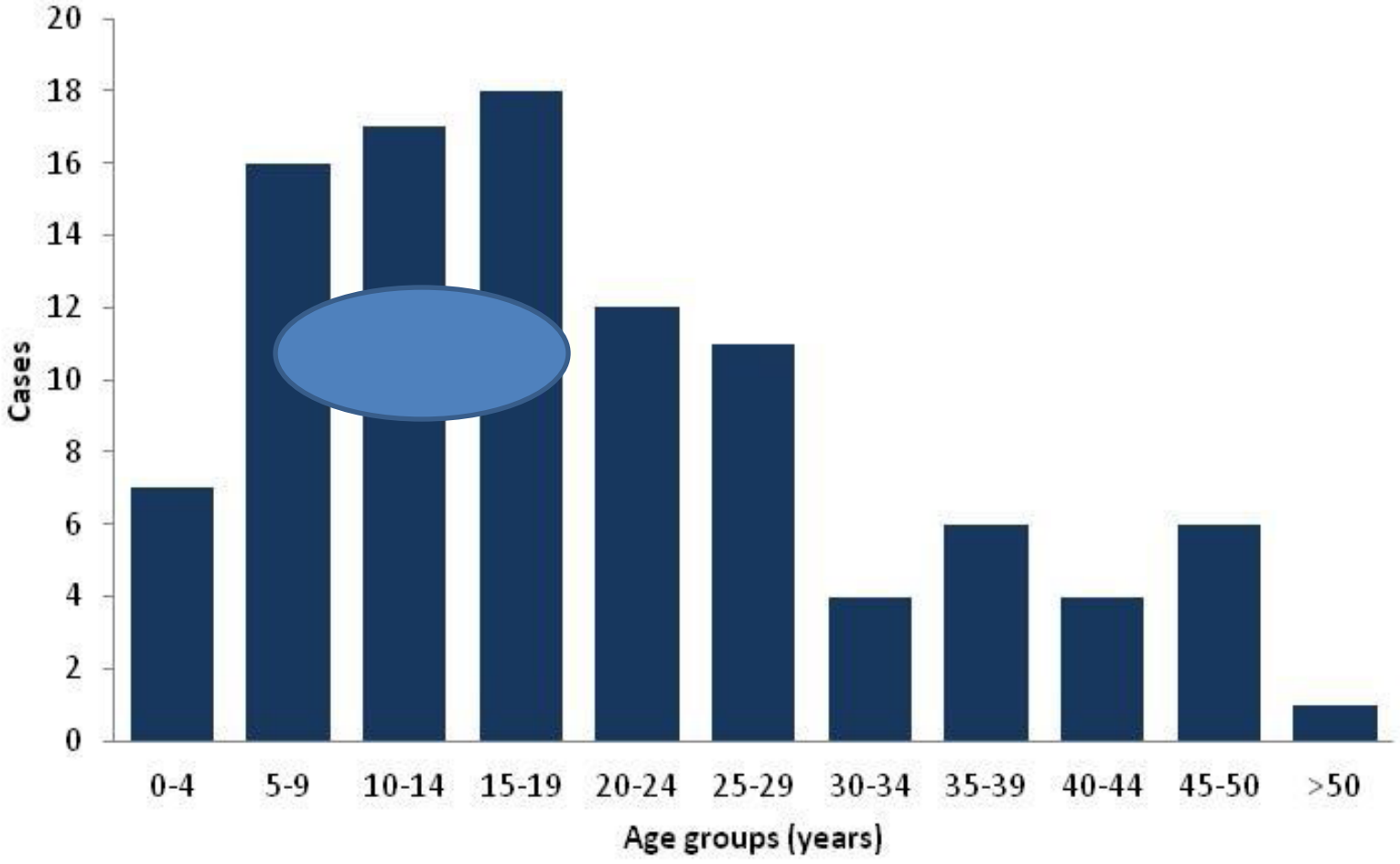
Typhoid burden of disease

Results

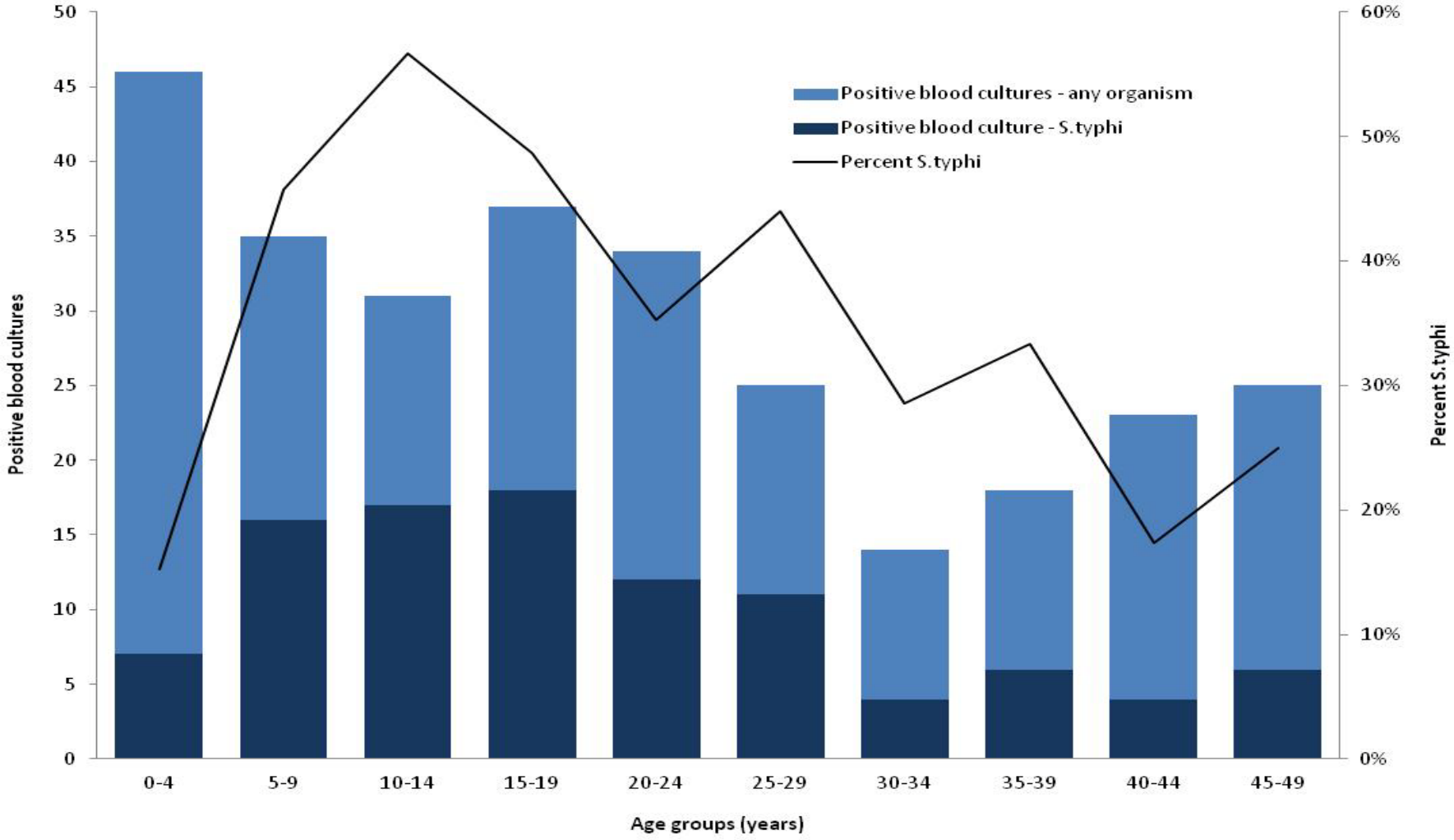
Age group (years)	S.Typhi isolated	Percentage of *S*.Typhi isolated by age group	Any bacteria isolated	Percentage of all culture isolates that were *S*.Typhi	Total blood cultures reported*	Percent of total cultures from which S.Typhi was isolated
<2	2	1.9%	28	7.1%	174	1.1%
2-4	5	4.8%	19	26.3%	121	4.1%
5-9	16	15.4%	35	45.7%	193	8.3%
10-14	16	15.4%	31	51.6%	171	9.4%
15-19	18	17.3%	36	50.0%	149	12.1%
20-24	12	11.5%	37	32.4%	206	5.8%
25-29	11	10.6%	27	40.7%	167	6.6%
30-34	4	3.8%	14	28.6%	122	3.3%
35-39	6	5.8%	19	31.6%	127	4.7%
40-44	4	3.8%	25	16.0%	104	3.8%
>45	6	5.8%	151	4.0%	689	0.9%
No age data	4	3.8%	20	20.0%	112	3.6%
Total	**104**	**100%**	**442**	**23.5%**	**2335**	4.5%

**There were no result reported for 46 blood cultures (45 from Upolu, 1 from Savaii). These cultures were excluded from analysis.*

S. Typhi positive blood cultures by age group, Samoa, July 2010-June 2011



Percent positive blood cultures by age group, Samoa, July 2010-June 2011



Economic cost of typhoid in Samoa from 2006-11

	Typical cost/ case (USD)	Typical cost/case (Tala)	Number of cases (2006-11)	Total cost (USD)	Total cost (Tala)	Tala per year
Hospitalized cases	$450	1039	1151	$520,000	1.2 million	240,000

* DOMI Project: The use of typhoid vaccines in Asia: the DOMI experience. CID, 2007

Conclusions

- Estimate rate is 270 cases/100,000/year
  - Range 134-460/100,000/yr
  - High endemic is defined as >100/100,000/yr
  - On a few countries globally have reported higher rates

- Typhoid fever is a serious public health threat in Samoa requiring a committed and coordinated response.

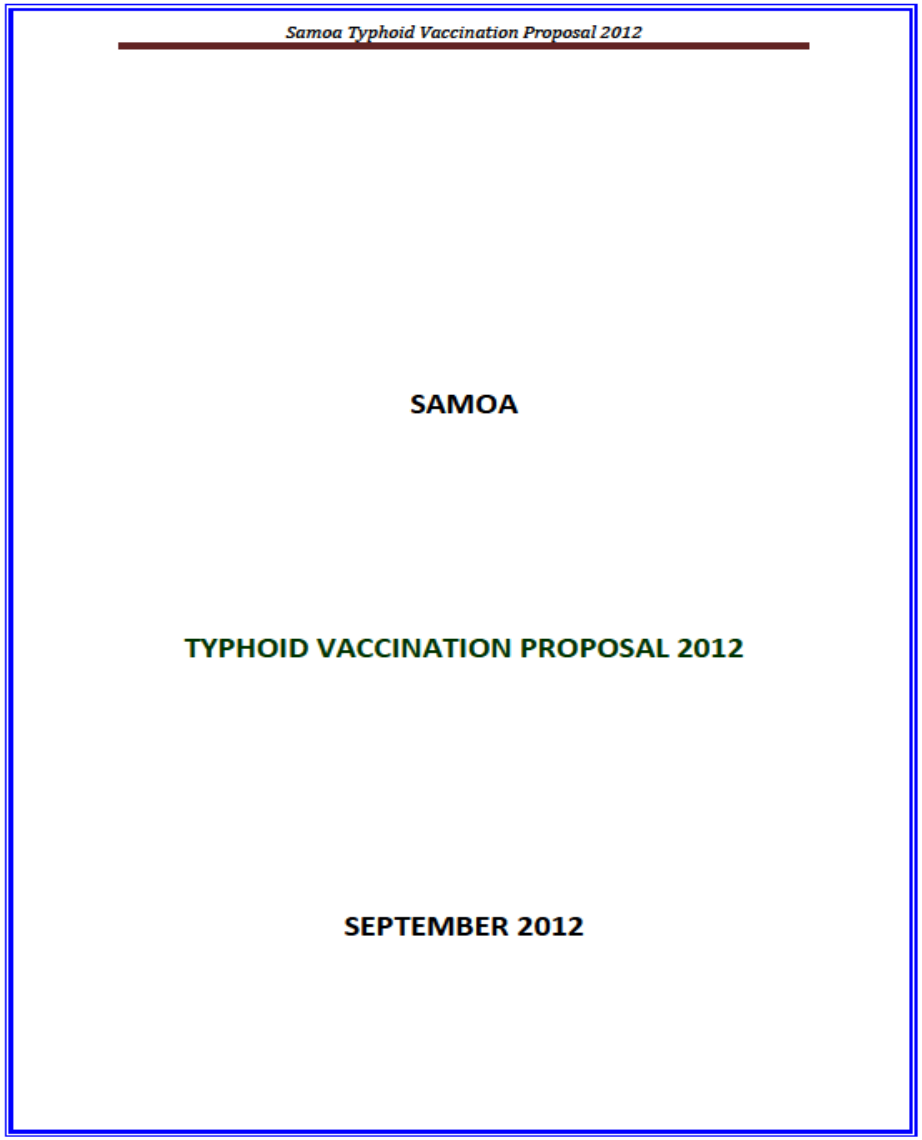
Recommendations

- Establish a **typhoid fever vaccination taskforce** to develop a vaccination proposal .
- Potential strategies exist including:
  - Mass vaccination (with injectable Vi vaccine) of the entire population greater than 2 years of age
  - Mass vaccination (with injectable Vi vaccine +/- Ty21a oral vaccine) of identified high risk areas and age groups
  - **Introduction of childhood vaccination program (with the Ty21a oral vaccine) at primary school entry and exit**
  - Routine immunization (with Vi or Ty21a vaccines) in specific groups every 3-5 years:
    - All health care and hospital laboratory workers
    - Food handlers working in food establishments
  - A combination of the above

Recommendations (continued)

- All typhoid vaccination programs **should be implemented in the context of other efforts to control the disease,** including health education, water quality and sanitation improvements, and training of health professionals in diagnosis and treatment
- Early Detection and Treatment – Continue to support the implementation of **treatment guidelines using ciprofloxacin** at adequate doses, and standard patient management
- Safe Water – ensure all drinking water has **sufficient chlorine,** or other controlled treatment process
- Sanitation – Continue to support the Samoa MOH initiative to **promote the use of other types of toilets** such as ventilation-improved pit (VIP) latrines as an alternative to flush toilets, especially where water is scarce.

Typhoid Vaccination



THANKS…..