

Breaking Good: Making Science Great Again

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International Conference on Typhoid and Other Invasive Salmonellosis
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Vision is not enough, it must be combined with venture.

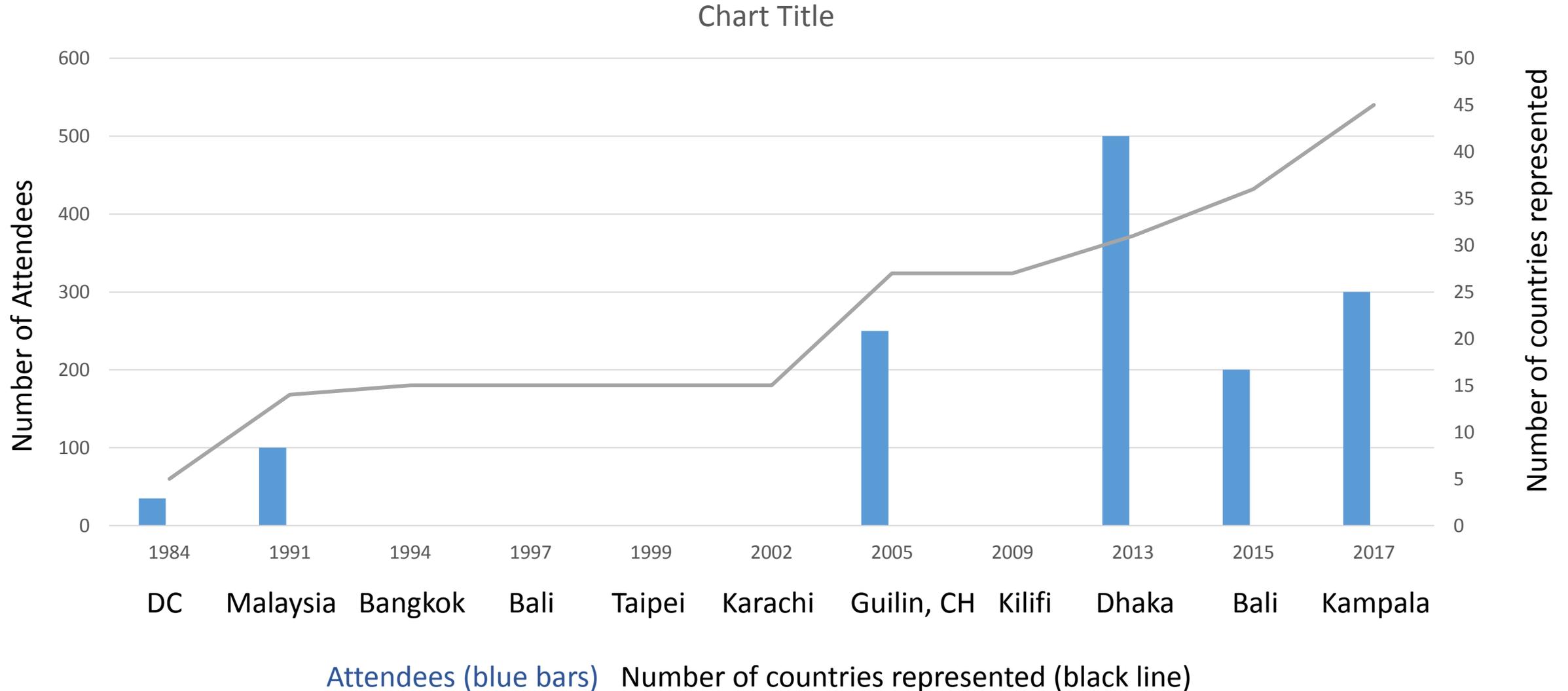
It is not enough to stare up the steps, we must step up the stairs.

- Vaclav Havel

Evidence to Action

- **What additional evidence would be helpful to drive action?**
- **Which additional actors need to be engaged?**
- **What additional tools are needed?**

International Symposia on Typhoid fever and Salmonellosis



Then and Now—what hasn't changed much

Highlights from the 1991 meeting

Limitations of diagnostic tests a problem

- **dependence on blood culture**
- **New tests on horizon (then it was EIA vs 52kDa protein and the potential for PCR)**
- **OMPs highlighted as potential tools for diagnostic assays**

“The search continues for the one simple reliable and inexpensive test”

“Typhoid is mainly a disease of underprivileged people living under conditions of poor hygiene, sanitation, and education and may take a long time to eradicate completely.”

1st Int’l Symposium on Typhoid Fever

Persistent Theme

From the 2002 Karachi meeting

“There should be surveillance of drug-resistant typhoid at a global level . . . as we know that determinants spread very easily across political and geographical boundaries”

Gordon Dougan

Then and Now—what has really changed

Highlights from the 1991 meeting

Molecular epidemiology/biology

Ribotyping-rRNA gene restriction patterns

PFGE subtyping

OMP studies with oligonucleotide probes; **WGS not an option**

Treatment

Chloramphenicol was drug of choice

Fluoroquinolone treatment discussed as effective, but too expensive!

Vaccine

Vi and Ty21A (with concerns on variable efficacy) were promoted for use

Whole cell vaccine widely used (especially in developing countries)

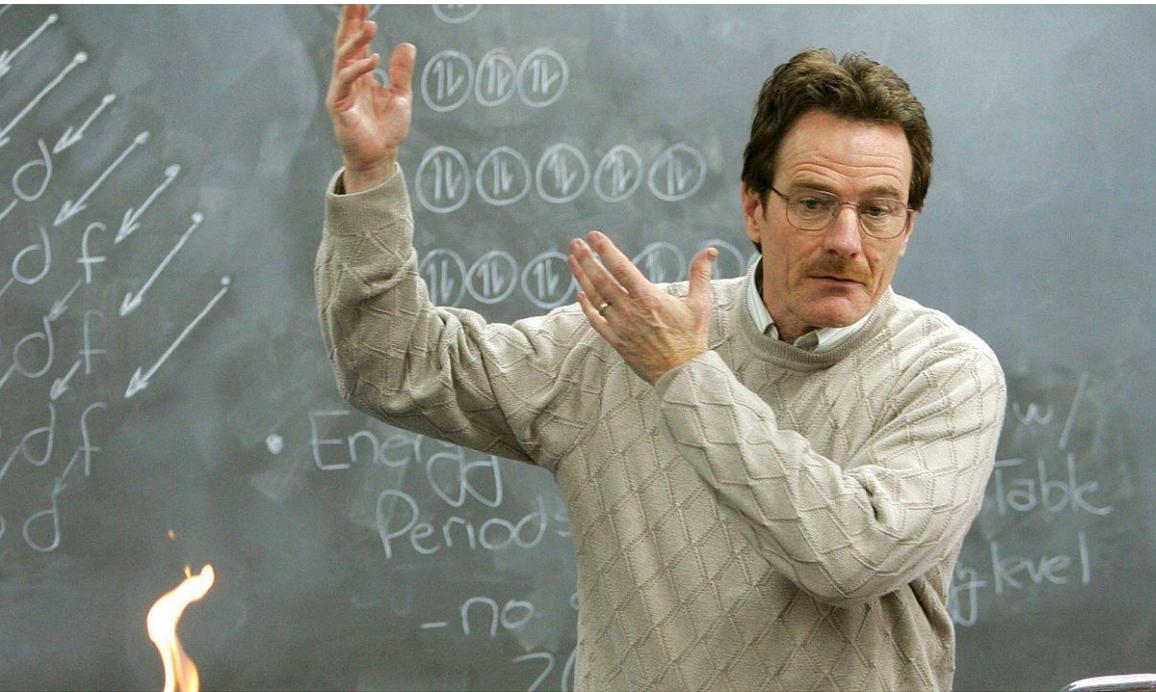
OMPs highlighted as potential vaccine candidates/**no mention of TCVs**

Human challenge models now available to refine response to vaccines!

Focusing on Better Evidence and Tools to drive Action

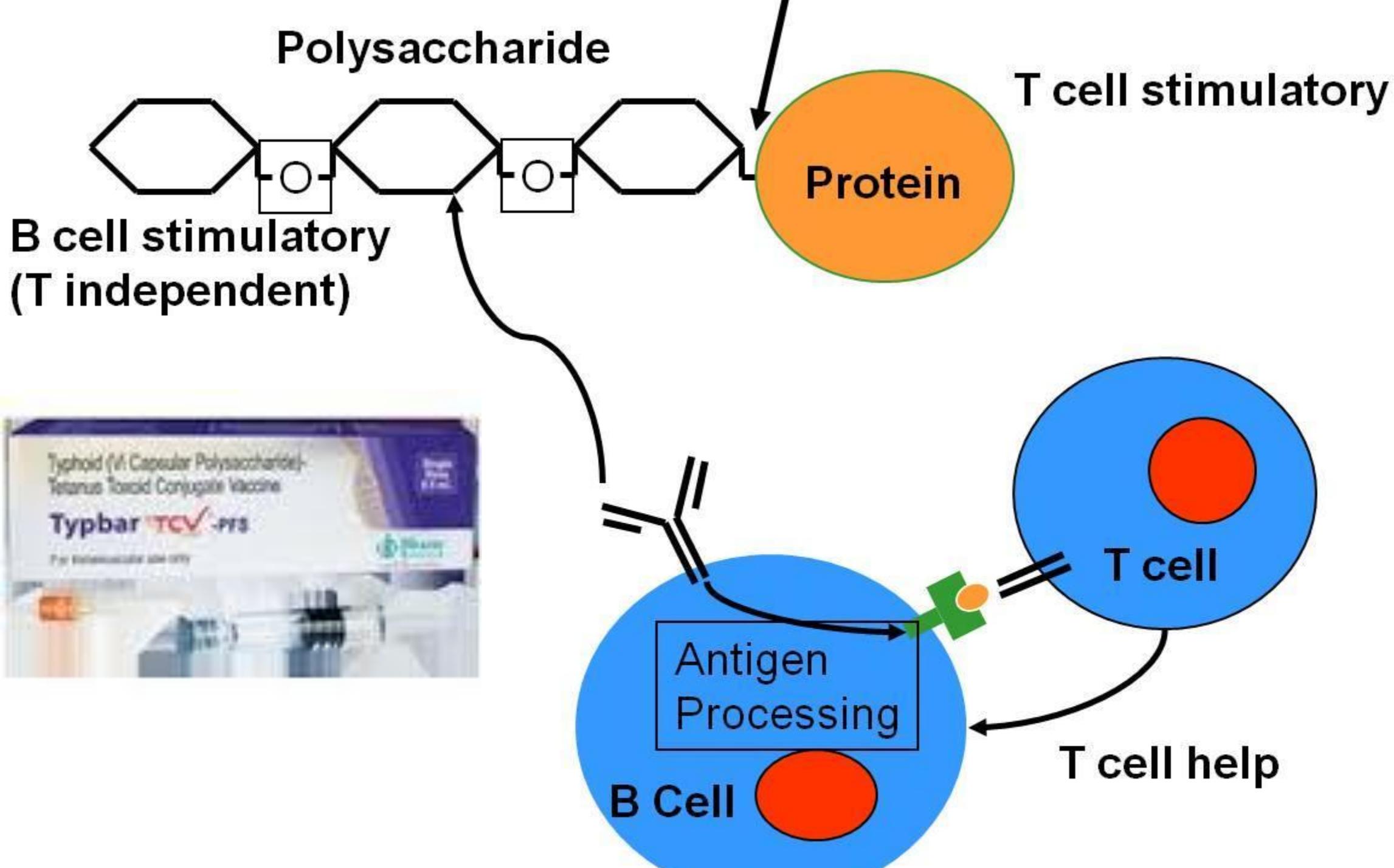


Caveat—don't discount basic science which may not have current implementation relevance, but will lead to it!



Breaking Good? (Breaking Even Better)

- **Long hx of vaccine development with principle focus on prevention of illness in wealthier nations.**
- **Few “inequities vaccines,” primarily addressing infrastructure and systems failures and diseases affecting the poorest of the poor**



**B cell stimulatory
(T independent)**

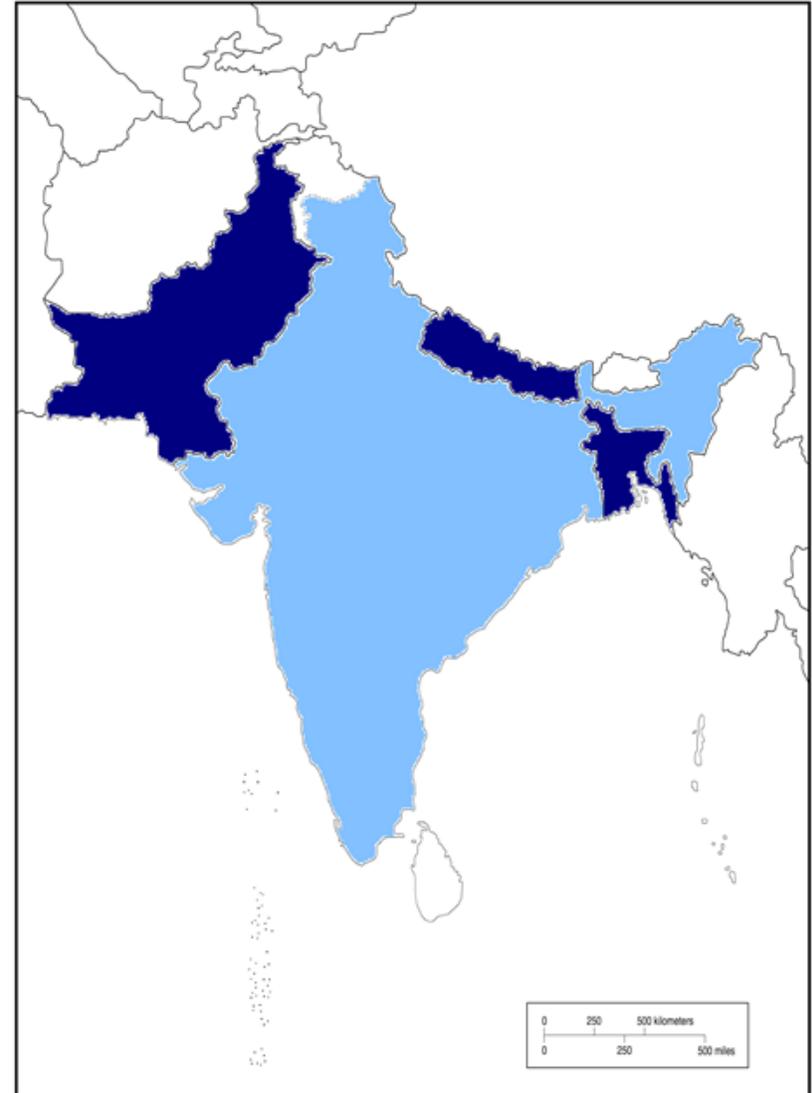




SETA



SEAP



Characterizing Burden of Enteric Fever—SETA/SEAP

- Population-based adjusted incidence
- Risk factors for severe illness
- Incidence of complications
- Case-fatality rates
- Evolving patterns of antimicrobial resistance
- Cost of illness: health care and societal perspective
- *Explore relationship between antimicrobial resistance, antimicrobials prescribed, and outcomes*

Provide baseline rate for assessing impact of future interventions

Archive isolates and plasma for future use in a Biobank

CHAMPS

Child Health and
Mortality Prevention
Surveillance

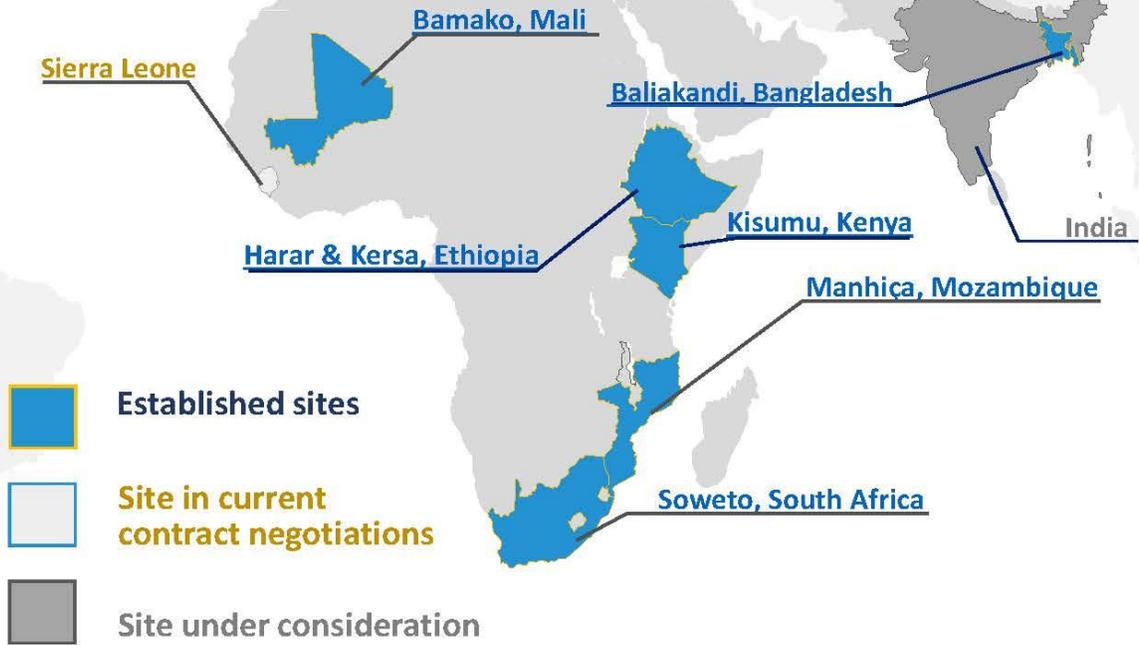
COUNTRY SITE MAP

6M

CHILDREN
UNDER 5 DIE
EACH YEAR
GLOBALLY

82%

of these deaths occur in
**SUB-SAHARAN AFRICA
+ SOUTH ASIA**

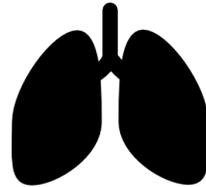




Specimen Collection: Minimally Invasive Tissue Sampling



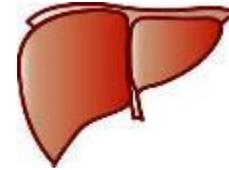
Brain



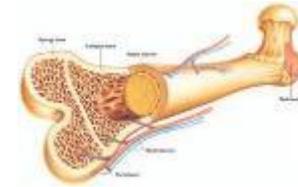
Lung



Heart



Liver



Bone Marrow



Blood



CSF



Stool



NP/OP swab

- **Abdominal approach - spleen / kidney**
- Placenta (P) , umbilical cord (U) if stillbirth or death immediately following birth
- Skin lesion if present and lymph node if palpable

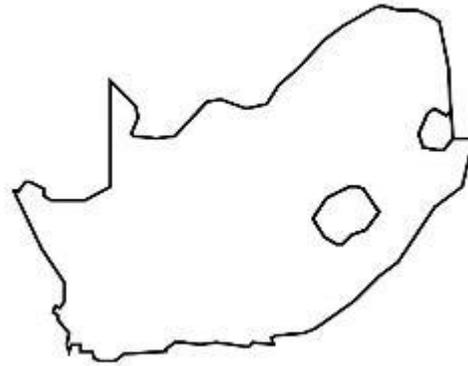
CHAMPS Data to Action

CHAMPS data will help inform a range of public health decisions – including policy – to help save young lives.



Local

Households, communities, health clinics, local and traditional leaders



National

Ministries of Health, National Public Health Institutes (NPHIs) – country ownership and sustainability



International

Building partnerships and networks to disseminate data, share knowledge and catalyze action

Evidence to Action

- **What additional evidence would be helpful to drive action?**
- **Which additional actors need to be engaged?**
- **What additional tools are needed?**

Evidence to Action

- **What additional evidence would be helpful to drive action?**
 - **Ensure that we can say about antimicrobial resistance is evidence driven—i.e. specter of a post-antibiotic era**
 - **Evaluate efficacy/effectiveness/impact of vaccines—TyVac!**
 - **What about environmental/sewage surveillance to help to fill in national/regional gaps from sentinel surveillance data?**
 - **Characterize increasing mobility of people making typhoid more “egalitarian”**



Evidence to Action

Which additional actors need to be engaged? (expanding the choir!)

- **Local and Regional Champions!**
 - **Engage and involve National Public Health Institutes and corresponding MoHs**
 - **Work with up and coming local public health leaders (FETP, MSc, PhD students)**
- **The media—typhoid fever cases should spark concern/outrage**
- **Business community?**
- **Align with the growing Planetary Health/Resilient Cities movements**

Evidence to Action

- **What additional tools are needed?**

- **Still need better diagnostic tests!**
- **More vaccine options/vaccine companies engaged—ensure supply, quality, and efficacy**
- **More “genetic epidemiology” to understand how S Typhi (and iNTS) moves around, changes, becomes more dangerous**
- **New treatment options**

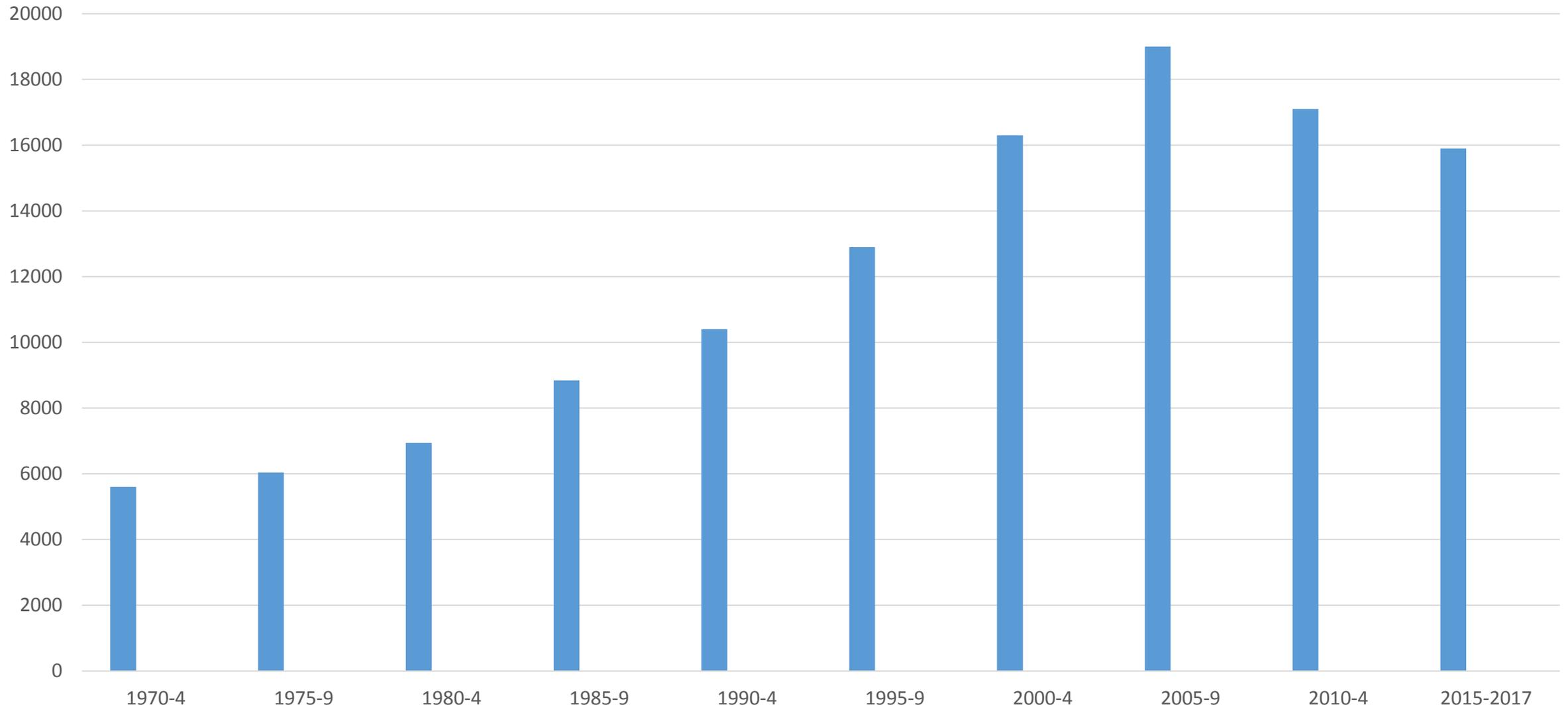


**Action speaks louder than
words but not nearly as often.**

-- Mark Twain

**The stars are truly aligned for action on
preventing typhoid.**

Publications on typhoid/*S. Typhi**



* caveat: From Google Scholar