Impact of American Indian Research on Global Health

Kate O’Brien on behalf of Center for American Indian Health
Department of International Health
Johns Hopkins Bloomberg School of Public Health

October 3, 2013 | University of Amsterdam
‘Discovering’ the New World
They (Arawak Indians – Bahamas) were well built with good bodies and handsome features....they do not bear arms, and do not know them...with fifty men we could subjugate them.
Bartolome De Las Casas (1484-1566)
Las Casas

• When the local chief learned that they were coming, he and up to twenty of his men came out of their town and league in order to welcome them, presenting them with a great deal of food and supplies...

• .....endless testimonies...prove the mild and pacific temperament of the natives...but our work was to exasperate, ravage, kill, mangle and destroy.

Zinn, H. “A People's History of USA 1492-Present”
Federal Health Service for Indian People

1803-War Department assigned responsibility for health of Indians
1830: Indian Removal Act
“Trail of Tears”
Trail of Tears

• From Georgia to Oklahoma removed Cherokee (Observer’s Description):

The Indians had their families with them, and they brought in the train the wounded, the sick, the newly born, and the old men upon verge of death. They possessed neither tents nor wagons, but only their arms and some possessions. There was no cry, no sob...all were silent.
Wrapped in blankets, a solemn group of little girls huddle together upon their arrival at the government school in Santa Fe, New Mexico, in 1886. One week later (right), they posed in calico dresses and straw hats.
Tom Torlino, a Navajo from Arizona, wore tribal headgear, earrings, and a necklace (above) upon his arrival at the Carlisle Indian School. A few years later (right), he appears with close-cropped hair wearing a suit and tie.
Epidemics of Infectious Diseases 1500’s-1800’s Among NA Populations

- Smallpox
- Measles
- Cholera
- Influenza
- Scarlet Fever
- Malaria
- Typhoid
Tuberculosis BCG Vaccine Trial

Aronson et al 1935 - 1938

Towsend et al Ann Rev Tuberc 1942; 45; 41-52

Vaccine Lot No: 2 Dose: 0.15 Mgm:

TUBERCULOSIS RECORD

Agency: Pima A

Schools: Casa Blanca

TUBERCULIN REACTION

Date: 3-10-36

Date of Birth: 4-6-28

Sex: M

Tribe: Kiowa

Degree of Blood: 4/4

Name of Father: Id. No.

Name of Mother: Id. No.

Addresses: Casa Blanca

Contact: YES NO Date Duration:

Name of Patient: Id. No.

Patient's Sputum: POS. NEG.

TUBERCULIN REACTION

<table>
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<tr>
<th>Date</th>
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<th>Date</th>
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<td>3-14-39</td>
<td>2/002</td>
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</table>

X-RAY EXAMINATION

ALIVE 1956

Date: 3-10-36

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<thead>
<tr>
<th>Date</th>
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<tr>
<td>May 1936</td>
<td>R 75</td>
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<td>3-2-37</td>
<td>C 819</td>
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<td>1-26-38</td>
<td>C 453</td>
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<td>3-23-39</td>
<td>C 278</td>
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<td>June 1940</td>
<td>2113</td>
<td>Negative</td>
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<td>5-3-41</td>
<td>792</td>
<td>Negative</td>
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<td>1942</td>
<td></td>
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(Over) ✓
BCG Vaccine Efficacy
52% (CI 27-69%)

Naomi Aronson, et al. JAMA May, 2004
Strategic Approach to Prevention

Diseases of disproportionate morbidity or mortality

Define Problem: Surveillance

Identify Causes: Risk factors

Test Interventions

Implement Intervention

Evaluate Effectiveness
American Indian General Health Status

- Life expectancy reduced
- Unemployment rates 30% +
- Housing
  - 60% heated by wood or coal
  - 15% no regular water source
  - 50% lack plumbing
  - 30% have no bedrooms
  - 75% have no landline phone
- Major health disparities
  - Diabetes rates
  - Teen/Youth suicide
  - Injury related deaths
  - Alcohol related deaths
  - Infectious disease morbidity/mortality
Indian Health Service
Mathuram Santosham
Incidence Symptomatic Hepatitis B in AK Natives 1981-2003

# Diarrhea mortality estimates

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Deaths per year (millions)</th>
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<tbody>
<tr>
<td>Snyder and Merson</td>
<td>1982</td>
<td>4.6</td>
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<tr>
<td>Institute of Medicine</td>
<td>1986</td>
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<td>Martines et al</td>
<td>1990</td>
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<td>Bern et al</td>
<td>1992</td>
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<td>World Dev. Report</td>
<td>1993</td>
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<td>Murray and Lopez</td>
<td>1998</td>
<td>2.4 – 2.9</td>
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<td>Bryce et al</td>
<td>2005</td>
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Oral Rehydration Therapy: USA Early 1980’s

Not Recommended

Safety concerns (Hypernatremia)
Oral Rehydration Therapy

…..potentially the most important medical advance this century

Lancet, August 5, 1978
“Frequency and volume of stools will usually subside rapidly in 48 hours.

When this occurs… oral feeding of one of the carbohydrate electrolyte mixtures may be initiated…

Usual dietary intake is achieved, usually in 7 to 8 days.”
Early vs Delayed Feeding on Duration of Diarrhea

Mean Duration (±SEM), Hours

Early Feeding

Delayed Feeding

* P<0.001

Pediatrics 76; no 2 Aug 1985
GASTROINTESTINAL DISEASE DEATHS

American Indian and Alaska Native and U.S. White

AI/AN, three-year average male and female all ages
Hib meningitis
White Mountain Apache tribe

• 3 month period (Oct-Dec 1981)
• 5 cases of invasive Hib disease among approximately 1,000 children <5 years
Manifestations of Hib disease

- Pneumonia
- Blood Stream Infections
- Meningitis
Annual Incidence of Hib Meningitis in Children Under 5 Years

Modified from Bijlmer, Vaccine, 1991; 9(suppl.):S5-9
Impact of Hib vaccine on Navajo children < 24 months of age
73 of the World's Poorest Countries are Eligible for GAVI Funding as of September 2013
This includes 56 countries that are currently phase III eligible and 17 graduating countries.

Routine Hib Immunization Programs in 2005
98 Countries, including 19 (25%) GAVI countries

GAVI countries:
- Non-GAVI country introductions
- GAVI introduced
- No GAVI application made

Status of Global Hib Vaccine Introduction*

99% of GAVI countries have introduced Hib vaccine.

*As of September 2013

- Orange: GAVI introduced/plan to introduce
- Light yellow: Non-GAVI introduced/plan to introduce
- Red: Non-GAVI, no plan to introduce

Note: China and Singapore have widespread Hib coverage through the private market.

By 2015, 27 more countries that are GAVI eligible will roll out PCV introduction. (This includes 21 countries that have been approved for GAVI support and 6 countries that are planning to apply for GAVI support.)

Global Introduction Status of Rotavirus Vaccine


Already Introduced (Universal)
41 Countries

Already Introduced (Regional)
6 Countries
Summary of CAIH Infectious Disease Project Timelines
(since Prevnar Trial, 1997-present)

- Haemophilus influenzae
- Respiratory Syncytial Virus
- Rotavirus
- Hepatitis A and B
- Helicobacter pylori
- Streptococcus pneumoniae
How many children can we save in 15 years?

Deaths in Children Under Age 5

7 Million

6 Million

5 Million

4 Million

3 Million

2 Million

1 Million

0

YEAR 2015 2020 2025 2030

Business as Usual

Best-case Scenario

49 MILLION CHILD DEATHS PREVENTED

Source: Analysis using Lives Saved Tool, Bloomberg School of Public Health, Johns Hopkins University
JOHNS HOPKINS CENTER FOR AMERICAN INDIAN HEALTH

PROGRAMS

Infectious Disease

Behavioral Health

Training

Service
Allison Barlow
Associate Director
Behavioral Health

Raymond Reid
Associate Director
William Osler to William Welch:
“Welch, it is lucky that we got in as professors; we could never have entered as students.”
“...half of what we teach you here is wrong – Unfortunately, we don’t know which half...”

-Lisa Sanders,
-New York Times
Traditional Philosophy

Navajo Blessing way chant

With beauty before me, there may I walk.  
With beauty behind me, there may I walk.  
With beauty above me, there may I walk.  
With beauty all around me, there may I walk.  
In beauty it is finished.