Tuberculosis in Alaska

Michael Cooper, MD, MS
Figure 3. Transmission of Tuberculosis and Progression from Latent Infection to Reactivated Disease.
Among persons who are seronegative for the human immunodeficiency virus (HIV), approximately 30 percent of heavily exposed persons will become infected. In 5 percent of persons with latent infection, active disease will develop within two years, and in an additional 5 percent, progression to active disease will occur later. The rate of progression to active disease is dramatically increased among persons who are coinfected with HIV.
Symptoms of Tuberculosis

(Established) pulmonary tuberculosis

Poor appetite

Miliary tuberculosis

Night sweats

Return of dormant tuberculosis

Cough with increasing mucus

Coughing up blood

Fever

Dry cough

Extrapulmonary tuberculosis

Common sites:
- Meninges
- Lymph nodes
- Bone and joint sites
- Genitourinary tract

Weight loss

Weakness

Primary pulmonary tuberculosis

Structural abnormalities

Tuberculous pleuritis

Chest pain

Gastrointestinal symptoms
**True or False**

- TB is the number one cause of death for Alaskans
- TB causes 20% of all deaths in Alaska
- 90% of third graders in YK are infected with TB
- 6 out of every 100 AK Natives has active TB
- Alaska has the highest rate of TB in the U.S.
2011 TB Incidence – “Top” States

Cases/100,000

<table>
<thead>
<tr>
<th>State</th>
<th>Cases</th>
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<tbody>
<tr>
<td>AK</td>
<td>9.3</td>
</tr>
<tr>
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</table>
Figure 3. Tuberculosis incidence rates, 1952–70

Figure 4. Cases of active tuberculosis by diagnostic category, all races, Alaska, 1964–69

Objectives

- Historical context
- The Battle
  - Lessons learned
- TB Control in Alaska today
15,000 years ago
AD 400 – probable TB – St. Lawrence Island
1500’s – probable TB – Pt. Barrow
1741 – Russian explorers and traders

Map 1-2 Alaska’s Native Languages and Cultures

North

0  200 Kilometers
0  200 Miles
POPULATION OF ALASKA, 1880-1953

Seward’s Folly - 1867
POPULATION OF ALASKA, 1880-1953

Seward’s Folly - 1867

Organic Act - 1884

CIVILIAN WHITE AND OTHER

NATIVE

MILITARY
Seward's Folly - 1867
Organic Act - 1884
Native Health = Bureau of Education - 1930
Territory - 1912
Seward’s Folly - 1867
Organic Act - 1884
Territory - 1912
Native Health = Bureau of Education - 1930
1931 - Alaska Native Service
First Health Commissioner - 1945
1931 - Alaska Native Service
1926-1930 AK Native TB death rate 655/100,000

1930-1936 AK Native TB death rate 810/100,000

1943 2,000-4,000 active TB cases 70 beds

1952 1,823/100,000 TB Incidence AK Native
“Perfect Storm” – 1800-1940’s

- Neglected Territory
  - Influx/exploitation
- Geography
  - Remote/expensive/harsh
- No health infrastructure
  - Territory vs. Federal obligations
- New diseases
  - Smallpox, measles, influenza
- Change in Native lifestyle
  - Settlement, exploitation, schools, crowding
“There is a Tide” – 1940-1950’s

- Interest in Alaska
- War
- C. Earl Albrecht
- Chemotherapy
- Parran Report
Interest in Alaska

- Financial
  - Gold
  - Fish/Whales
  - Minerals

“...physical deficiencies of the Natives, unless promptly attended to, become a menace to their white neighbors.” J. Strong, 1917, 1st Governor Alaska
The role of war as the great destroyer is familiar to everyone, but less has been said of war as the great constructor. - Ernest Gruening – Alaska Governor, 1951
C. Earl Albrecht

- FDR – New Deal - Mat Su – 1935
- Army hospital
- 1st Commissioner of Health
- Singular determination
Chemotherapy

- Streptomycin – 1948
- PAS – 1951
- Isoniazid – 1952
Parran Report – 1953-1954

- Alaska’s Health: A Survey Report

- Resounding critique
  - “Century of official neglect”

- Detailed recommendations

http://www.hss.state.ak.us/commissioneer/PDF/Parran_Report.pdf
“Tuberculosis is the Alaskan Scourge”

It still shows “the scars of an exploited colony.”
  “Health conditions...are deplorable”

“We must help Alaskans to help themselves.”
  “..disgraceful burden of disease” in our own country
  Achilles heel – defense
Parran Report - “Two Worlds”

- White Alaska
  - “young, vigorous, urbanized”
  - “life-expectancy as favorable as...states.”

- Native Alaska
  - “sickness, crippling conditions, premature death”
  - “...a degree exceeded in very few parts of the world.”
Parran Report - “Two Worlds”

• 1953 – active TB registry
  • White – 222/100,000 (US 151/100,000)
  • Alaska Native – 6,474/100,000 (6%)
    • 2,363 AN cases, population 32,000
Parran Report – Achilles heel

“without effective manpower...Alaska is our Achilles heel.”
Parran Report – Achilles heel

- Alaska National Guardsman - 1953
  - 200 random x-rays
  - 10% active tb
  - 40% tb
- Scout battalions – 1954
  - 10% unfit due to active TB
“Alaska's health and well-being is purchasable.”

“Only by a crash attack...”
“There is a Tide” – 1940-1950’s

- Interest in Alaska
- War
- C. Earl Albrecht
- Chemotherapy
- Parran Report
Rapid Decline

Table 4. Average annual tuberculosis infection rates among Eskimo children 0–3 years of age, in three successive periods, Yukon-Kuskokwim delta, Alaska

<table>
<thead>
<tr>
<th>Survey</th>
<th>Positive reactors (percent)</th>
<th>Average annual infection rate¹ (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1949-51</td>
<td>34.4</td>
<td>24.6</td>
</tr>
<tr>
<td>1957</td>
<td>14.4</td>
<td>8.5</td>
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<tr>
<td>1960</td>
<td>1.7</td>
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¹ During the 3-year period prior to each survey.

Figure 2. Prevalence of tuberculin sensitivity among Eskimo children tested in three successive surveys, by age

Decline of the Tuberculosis Epidemic in Alaska, Comstock G, Philip R, Jan 1961
How the war was “won”
How the war was “won”

- Social and economic improvements
- Education
- Collaboration
- Volunteers
How the war was “won”

- Vigorous case finding
- Treatment
- Isolation/beds

1953 – 400 bed hospital in Anchorage – Alaska Native Service
How the war was “won”

- Ambulatory Chemotherapy Program - 1953

- Bethel Prophylaxis Study – 1957
  - Approximately 70% reduction in risk of active TB
  - Peak benefit when 70% of annual dose taken
  - No increased benefit with 200% of annual dose
  - Benefit at least for 15 years, ‘probably lifelong”

- Isoniazid dosing study
  - 5mg/kg vs. 1.25 mg/kg
How the war was “won”

- Mass X-ray surveys
- Village “sweeps” – Hot Spot Team
  - Dog sleds
  - Mobile Health Unit
- Marine units
- Community Health Aides
How the war was “won”

- Money
  - 1946 - 10% of entire budget – TB

- Centralization
  - Bureau of Education
  - Alaska Native Service
  - USPHS

- Alaska Department of Health
Role of BCG, 1949-1951 (1956)

“no significant part of the reduction in tuberculosis can be attributed to BCG”
TB in Alaska today

“...roaming free and quietly stalking its prey once more.” – R. Fortuine, 1998 (author of “Must We All Die?”)
TB in Alaska today

- Less interesting
- Less money
- Less expertise
- Less collaboration
TB in Alaska today

- Less interesting
- Less money
- Less expertise
- Less collaboration
- Same challenges
  - Geography, travel, remoteness, cost, health infrastructure
- New challenges
  - Homeless, prisoners, immigrants, MDR, recrudescence, HIV/AIDS
2011 TB Incidence – “Top” States

Cases/100,000

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AK TB Cases, by Race, 2001-2010

- White: % Population
- AI/AN: % Population, % TB cases
- Asian/PI: % Population, % TB cases
- Afr Am: % Population, % TB cases
TB Cases by Region, 2006-2011

Anchorage/Mat-Su
Southwest
Northern
Interior
Southeast
Gulf
Incidence by Region, 2006-2011

Cases per 100,000

Anchorage/Mat-Su  Southwest  Northern  Interior  Southeast  Gulf

State Incidence  US Incidence
TB in Alaska today

Map 1-2 Alaska’s Native Languages and Cultures
TB in Alaska - tomorrow

- Collaboration
  - Epi/TB Control
  - PHN
  - Providers
  - Villages

- Creativity

- Interest
Acknowledgements

• All those involved in Alaska’s historic battle with TB

• State of Alaska, Division of Public Health
  • Infectious Disease Program
  • Public Health Nursing

• Front line providers

• Community Health Aides

• Volunteers
Chart VI

Percentage of deaths caused by different communicable diseases - Alaska 1945

- Tuberculosis
- Pneumonia
- Influenza
- All other causes

PERCENT

0

10

20

30

40

50

60

70

80

90

100