Cancer among Alaska Native people

Sarah Nash, PhD MPH CPH
Alaska Native Tumor Registry

Manaliq Board of Directors’ Meeting
November 20th, 2019
I in 5 deaths among Alaska Native people is due to cancer.

Cancer is the third leading cause of Years of Potential Life Lost, accounting for 12%.

Outline

Alaska Native Tumor Registry

Cancer incidence

Cancer mortality

Cancer prevention
Outline

Alaska Native Tumor Registry

Cancer incidence

Cancer mortality

Cancer prevention
Today

Your ANTR Team
The Alaska Native Tumor Registry is a collection of cancer stories.
Outline

Alaska Native Tumor Registry

Cancer incidence

Cancer mortality

Cancer prevention
WHAT DO YOU KNOW ABOUT CANCER?

39 out of 100 Alaska Native Men will be diagnosed with cancer
- 9 with lung cancer
- 7 with colon cancer
- 5 with prostate cancer

47 out of 100 Alaska Native Women will be diagnosed with cancer
- 12 with breast cancer
- 8 with lung cancer
- 8 with colon cancer

Data Source: Alaska Native Tumor Registry
Leading cancers among AN people are very similar to US whites

Female Breast
Colorectal
Lung
Prostate
Kidney

Prostate
Female Breast
Lung
Colorectal
Melanoma
But there are distinct differences between the two population groups

Female Breast
Colorectal
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But there are distinct differences between the two population groups

Female Breast
Colorectal
Lung
Prostate
Kidney

Prostate
Female Breast
Lung
Colorectal
Melanoma
Disparities among less common cancers

Liver

Gallbladder

Stomach

Nasopharynx
Cancer incidence trends among AN people have mirrored those among US whites.
Cancer incidence trends and disparities differ between men and women

Age-Adjusted incidence rate, per 100,000 population

20% higher

AK Native Women
AK Native Men
US White Women
US White Men
Cancer incidence varies by tribal health region

Data source: Alaska Native Tumor Registry, Alaska Native Epidemiology Center Cancer Incidence Factsheet
Outline

- Alaska Native Tumor Registry
- Cancer incidence
- Cancer mortality
- Cancer prevention
Cancer mortality is 35% higher among AN people than the Alaskan average.

Data source: Alaksa IBIS Indicator reports 2018
Alaska Native people have higher mortality than US whites for all leading causes of cancer death.
Cancer mortality has been 1.5 times higher among Alaska Native people than US whites for over two decades.
Cancer survival varies by cancer site

90%

Female Breast

Nash et al Cancer 2018
Outline

Alaska Native Tumor Registry

Cancer incidence

Cancer mortality

Cancer prevention
Most Preventable: Lung Cancer (Men)

- Preventable: 88%
- Non-preventable: 12%

Among women: 69.8% lung cancers preventable
We may be able to prevent...

459 cases from 13 cancers

316 cases from 13 cancers

...If we could eliminate smoking
Smoking prevalence

2x higher

37% Alaska Native
17% Alaskan white

Data source: AK BRFSS: 2009-2017
56% of Alaska Native people reported a quit attempt in the last year

Data source: AK BRFSS: 2009-2017
Most Preventable: Endometrial Cancer

- Preventable: 18%
- Non-preventable: 82%
We may be able to prevent…

115 cases from 3 cancers

287 cases from 5 cancers

… with guideline-adherent physical activity levels
71% of Alaska Native people reported engaging in leisure time activity

Data source: AK BRFSS: 2011-2015
We may be able to prevent…

108 cases from 11 cancers

80 cases from 10 cancers

… by maintaining healthy weight
84% of Alaska Native people report eating less than 5 fruits or veggies a day.

95% of Alaska Native people reported eating at least one traditional food.

Source: Redwood et al Current Advances in Nutrition, In press
Most Preventable: Oral Cavity Cancer (Men)

Among women, **27.3%** oral cancers could be prevented by eliminating heavy drinking.
We may be able to prevent...

93 cases from 8 cancers

45 cases from 9 cancers

... with elimination of moderate to heavy drinking
92% of Alaska Native people report that they do not heavily drink

Source: Alaska Division of Public Health, Informed Alaskans BRFSS, 2011-2017
I GOT SCREENED.
Now, I'm talking about it.

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I GOT SCREENED.
Now, I'm talking about it.
Screening can have a huge impact on cancer rates: the case of cervical cancer

Age-Adjusted Incidence Rates per 100,000

- AK Native Women
- US White Women
Healthy Alaskans goal: 61%

Proportion of Alaska Native women receiving a mammography in the last 2 years

Source: Alaska Behavioral Risk Factor Surveillance System,
Healthy Alaskans goal: 82%

Proportion of Alaska Native women up to date on PAP screening

Alaska Comprehensive Cancer Plan Goal: 80%

Proportion of Alaska Native people up to date with colorectal cancer screening

Source: Alaska Behavioral Risk Factor Surveillance System, 2010-2016
Together, we CAN prevent cancer among Alaska Native people
Thank You

gunalchéesh • ‘awa’ahdah • chin’an • mahsi’
tsin’e e • way dankoo • háw’aa • quyana

Sarah Nash, PhD, MPH • shnash@anthc.org
Methods: Data Sources and Definitions

Risk Factor Prevalence, 2011 - 2015
Alaska Behavioral Risk Factor Surveillance Survey (BRFSS) (Alaska DHSS, CDC)

Current smokers: smoked >100 cigarettes, and current smoking

Obesity: body mass index (BMI) ≥ 30kg/m²

Physical inactivity: not meeting the CDC-recommended 150 minute/week of aerobic activity. 2011, 2013, and 2015 surveys only.

Alcohol intake*: moderate drinking = 12.5 ≤ 50g (1-4 drinks)/d
                heavy drinking = >50 g (4 drinks)/d

*Bagnardi et al 2015
Methods: Cancer Sites

**Smoking**: acute myeloid leukemia (AML), bladder, colon and rectum, esophagus, kidney, larynx, liver, lung, oral cavity, pancreas, stomach, and uterine cervix

**Obesity**: esophagus, stomach, colon and rectum, liver, gallbladder, pancreas, postmenopausal breast, kidney, advanced prostate, thyroid, and endometrium

**Physical inactivity**: colon, lung, prostate, breast, endometrium, and ovaries

**Moderate/heavy alcohol use**: colorectal, esophageal squamous cell carcinoma, gallbladder, larynx, liver, lung, oral cavity, stomach, prostate, and breast

* Surgeon General’s 2014 Report on Smoking and Cancer
** WCRF 2010 Obesity and Cancer Report
***Friedenreich et al 2010, ****Bagnardi et al 2015
Methods: Proportion and number of potentially preventable cases

**Population attributable risk (PAR)** estimated using Levin’s formula:

\[
\text{PAR} = \frac{P_{\text{pop}} \times (\text{RR}-1)}{P_{\text{pop}} \times (\text{RR}-1) + 1}
\]

where \(P_{\text{pop}}\) = risk factor prevalence, \(\text{RR}\) = relative risk (estimates from recent meta-analyses)

**Estimated preventable cancers (EPC)** estimated as:

\(\text{PAR} \times \text{Number of cases, AN people, 2011-2015}\)
## Population Attributable Risk: Tobacco

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Male PAR (%)</th>
<th>Male EPC</th>
<th>Female PAR (%)</th>
<th>Female EPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Myeloid Leukemia</td>
<td>3.6</td>
<td>0.7</td>
<td>3.1</td>
<td>0.4</td>
</tr>
<tr>
<td>Bladder</td>
<td>47.3</td>
<td>16.6</td>
<td>42.9</td>
<td>7.3</td>
</tr>
<tr>
<td>Colorectal</td>
<td>7.3</td>
<td>24.9</td>
<td>8.9</td>
<td>30.2</td>
</tr>
<tr>
<td>Esophagus</td>
<td>38.9</td>
<td>13.6</td>
<td>31</td>
<td>6.5</td>
</tr>
<tr>
<td>Kidney and Renal Pelvis</td>
<td>19.8</td>
<td>21.3</td>
<td>10.9</td>
<td>9.2</td>
</tr>
<tr>
<td>Larynx</td>
<td>71.5</td>
<td>14.3</td>
<td>67.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Liver</td>
<td>26.3</td>
<td>13.2</td>
<td>14.7</td>
<td>3.5</td>
</tr>
<tr>
<td>Lung</td>
<td>78.8</td>
<td>274.4</td>
<td>69.8</td>
<td>198.2</td>
</tr>
<tr>
<td>Oral Cavity</td>
<td>50.5</td>
<td>43.9</td>
<td>46</td>
<td>23.9</td>
</tr>
<tr>
<td>Pancreas</td>
<td>20.9</td>
<td>11.7</td>
<td>20.3</td>
<td>10.8</td>
</tr>
<tr>
<td>Stomach</td>
<td>23.7</td>
<td>24.4</td>
<td>13.6</td>
<td>10</td>
</tr>
<tr>
<td><strong>Female only cancers</strong></td>
<td></td>
<td></td>
<td>22.6</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>459.0</strong></td>
<td></td>
<td><strong>316.1</strong></td>
<td></td>
</tr>
</tbody>
</table>
# Population Attributable Risk: physical inactivity

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PAR (%)</td>
<td>EPC</td>
</tr>
<tr>
<td>Colon</td>
<td>13.6</td>
<td>29.9</td>
</tr>
<tr>
<td>Lung</td>
<td>17.5</td>
<td>61.2</td>
</tr>
<tr>
<td><strong>Male only cancers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prostate</td>
<td>11.1</td>
<td>23.7</td>
</tr>
<tr>
<td><strong>Female only cancers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Endometrium</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Ovarian</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>114.8</td>
<td></td>
</tr>
</tbody>
</table>
Obesity was associated with a smaller, but still substantial, proportion of cancers

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Male PAR (%)</th>
<th>Male EPC</th>
<th>Female PAR (%)</th>
<th>Female EPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon</td>
<td>12.6</td>
<td>27.7</td>
<td>4.4</td>
<td>11.1</td>
</tr>
<tr>
<td>Rectum</td>
<td>6.9</td>
<td>8.2</td>
<td>1.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Esophagus</td>
<td>3.5</td>
<td>1.2</td>
<td>2.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Gallbladder</td>
<td>13.9</td>
<td>1.1</td>
<td>22.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Kidney and Renal Pelvis</td>
<td>15.0</td>
<td>16.1</td>
<td>25.7</td>
<td>21.6</td>
</tr>
<tr>
<td>Liver</td>
<td>22.9</td>
<td>11.5</td>
<td>14.0</td>
<td>3.4</td>
</tr>
<tr>
<td>Pancreas</td>
<td>11.9</td>
<td>6.7</td>
<td>9.6</td>
<td>5.1</td>
</tr>
<tr>
<td>Stomach</td>
<td>3.2</td>
<td>3.3</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Thyroid</td>
<td>4.0</td>
<td>1.1</td>
<td>9.0</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Male only cancers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced prostate</td>
<td>4.3</td>
<td>3.2</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Female only cancers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postmenopausal breast</td>
<td>--</td>
<td>--</td>
<td>5.7</td>
<td>26.0</td>
</tr>
<tr>
<td>Endometrium</td>
<td>--</td>
<td>--</td>
<td>36.9</td>
<td>29.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>80.1</strong></td>
<td></td>
<td><strong>107.8</strong></td>
<td></td>
</tr>
</tbody>
</table>
Finally, alcohol use may also be a target for cancer prevention strategies

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>Moderate drinking</th>
<th></th>
<th>Heavy drinking</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Males</td>
<td>Females</td>
<td>Males</td>
</tr>
<tr>
<td></td>
<td>PAR (%)</td>
<td>EPC</td>
<td>PAR (%)</td>
<td>EPC</td>
</tr>
<tr>
<td>Colorectal</td>
<td></td>
<td>2.5</td>
<td>8.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Esophageal SCC</td>
<td>12.9</td>
<td>2.8</td>
<td>2.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Gallbladder</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Larynx</td>
<td></td>
<td>5.0</td>
<td>1.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Liver</td>
<td></td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Oral cavity</td>
<td></td>
<td>9.1</td>
<td>7.9</td>
<td>4.6</td>
</tr>
<tr>
<td>Stomach</td>
<td></td>
<td>--</td>
<td>--</td>
<td>2.4</td>
</tr>
<tr>
<td>Female only cancers</td>
<td></td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>4.4</td>
<td>4.4</td>
</tr>
</tbody>
</table>
# Changes in cancer survival over time

<table>
<thead>
<tr>
<th>Cancer Site</th>
<th>Count</th>
<th>Adjusted Hazard Ratio*</th>
<th>Confidence Interval (95%)</th>
<th>$\chi^2$</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Breast</td>
<td>996</td>
<td>0.90</td>
<td>0.62-1.31</td>
<td></td>
<td>0.581</td>
</tr>
<tr>
<td>Colon and Rectum</td>
<td>1076</td>
<td>0.81</td>
<td>0.66-1.01</td>
<td></td>
<td>0.057</td>
</tr>
<tr>
<td>Kidney and Renal Pelvis</td>
<td>233</td>
<td>0.80</td>
<td>0.48-1.35</td>
<td></td>
<td>0.398</td>
</tr>
<tr>
<td>Lung and Bronchus</td>
<td>926</td>
<td>0.83</td>
<td>0.72-0.97</td>
<td></td>
<td>0.015</td>
</tr>
<tr>
<td>Prostate</td>
<td>331</td>
<td>0.86</td>
<td>0.41-1.82</td>
<td></td>
<td>0.695</td>
</tr>
</tbody>
</table>

* Multivariable Cox proportional hazards models, adjusted for sex (with the exception of cancers of the prostate and female breast), age at diagnosis, and stage at diagnosis. Reference = earlier period (1992 – 2013)
Alaska Native people have the highest rates of cancer in Alaska

Data source: Alaska Cancer Registry, 1992 - 2012
Alaska Native people have the highest cancer mortality in Alaska

Data source: Alaska Cancer Registry, 1996-2012
OUR VISION:
Alaska Native people are the healthiest people in the world.