Alaska Native NICU Outcomes: 2009-2015

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Overreaching Goal

- There should be no difference between Alaska Native and Non Alaska Native neonatal mortality.
- This has been our goal of neonatal care in Alaska since the 1980s when Alaska Native neonatal mortality was 4 fold that of the Non Alaska Native population.
- All Alaskans should benefit from access to advanced maternity and neonatal care and to the advances in perinatal / neonatal care.

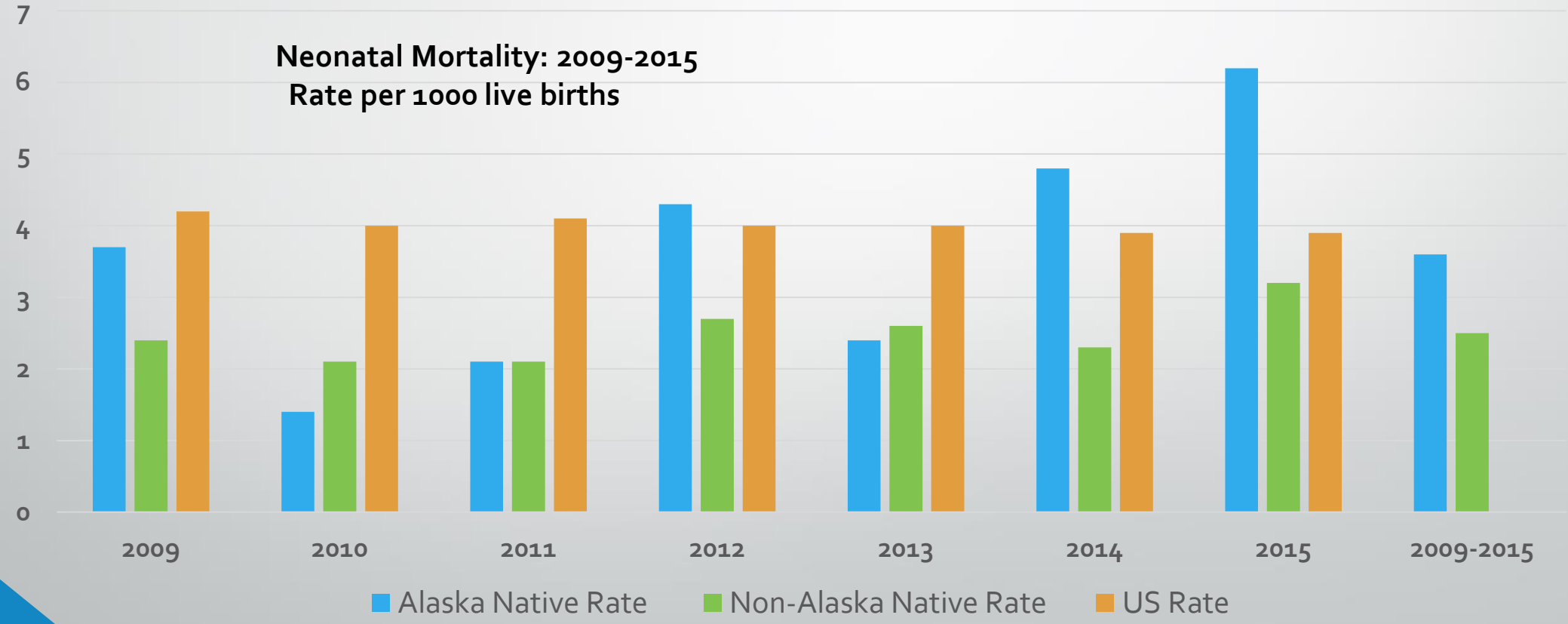
Preterm Outcomes:
22-29 weeks Gestation

- Group with the highest mortality and long-term morbidity
- Best metric to gauge effectiveness of shared goal of improving neonatal outcomes for all Alaskans
- Greatest impact on neonatal mortality
- There are many reasons for Alaska having one of the lowest neonatal mortalities in the US, the high survival rates of preterm and extremely preterm babies plays an important role.

Where does the data come from?

- State of Alaska Vital Statistics
- Alaska Neonatology Database of admissions and discharges from the NICU at Providence Alaska Medical Center.
- Database has existed since 1991.
- Purpose: raising questions and provide answers about our practice, and for quality improvement work.
- Alaska Neonatology has a database manager + tech support for this purpose and for the purposes of clinical research.
- Database does not depend on direct EMR or clinician input in order to maintain data integrity.

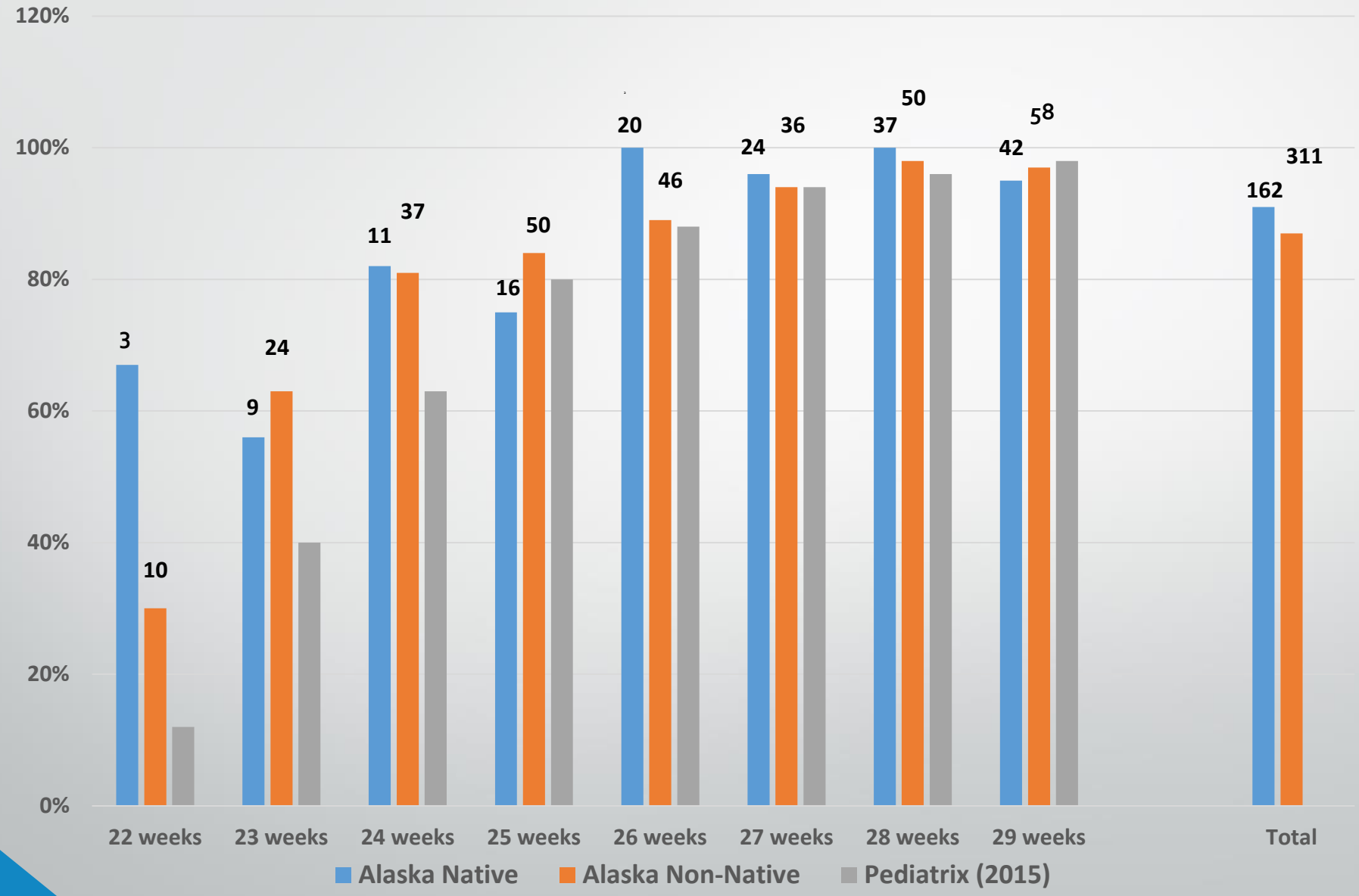
Neonatal Mortality: State Data



Conclusions from State Data

- For the last 7 years combined both Alaska Native and Non Alaska Native neonatal mortality is lower than the national average.
- There are years (2010, 2011, 2013) where the mortality rates are comparable for Alaska Natives and Non Alaska Natives.
- Recent years (2014-2015) Alaska Native Mortality is higher than Non Alaska Native and higher than US.
- Why is this important? Knowing what factors contribute to excessive neonatal mortality so high priority preventative strategies can be addressed and resources applied.

NICU Survival by Gestational Age: 2009-2015



Conclusion

- Differences in Alaska Native and Non Alaska Native are minimal for those that enter NICU care.
- What are some of the other possibilities for a higher Alaska Native neonatal mortality?

  - preterm / term deaths that do not get to care
  - deaths from major congenital anomalies
  - deaths after birth related to perinatal events
  - deaths at home or after going home-SUID, accidents, etc.
  - others?

Are there answers?
Do lethal congenital anomalies contribute?

- Analysis of all NICU deaths > 29 weeks GA occurring in the NICU.
- From 2009-2015 there were 18 Alaska Native deaths in NICU vs. 37 for Non Alaska Native.
- "lethal anomalies" represented 61% of Alaska Native deaths (Lung Hypoplasia/ Pena Shokir, chromosomal, severe AVM, metabolic, amniotic bands).
- "lethal anomalies" represented 57% of Non Alaska Native deaths (chromosomal, CDH, lung hypoplasia, CHD, cardiomyopathy, SMA).
- NICU deaths from "lethal anomalies" accounts for 0.55 deaths / 1000 births for Alaska Natives compared to 0.35/1000 births for Non Alaska Natives.
- *Lethal congenital anomalies account for a slightly higher neonatal mortality for the Alaska Native population.*

Other sources of NICU deaths > 29 weeks GA

- HIE accounted for 28% of Alaska Native deaths (0.24 deaths/1000 births).
- HIE accounted for 22% of Non Alaska Native deaths (0.13 deaths/1000 births).
- This represents preventable mortality.

- Other causes of death for Alaska Natives: infection (HSV), NEC, Hirschprungs disease.
- Other causes of death for Non Alaska Natives: Infection, PPHN, NEC, bowel perforation, pulmonary hemorrhage.
- All NICU deaths > 29 weeks accounted for 0.9 deaths /1000 births for Alaska Natives compared to 0.6 deaths/1000 births.
- *NICU deaths are slightly higher for Alaska Natives for babies > 29 weeks GA*

“Preventable” deaths

- NICU deaths > 29 weeks GA that could be considered to be preventable accounted for 0.35 deaths/1000 births for Alaska Natives.
- Compared to 0.27 deaths/1000 births for Non Alaska Natives.
- *Differences in “preventable” NICU mortality are minimally different.*

Conclusion

Recent statewide differences in neonatal mortality between Alaska Natives and Non Alaska Natives cannot be fully explained by differences in Neonatal Intensive Care outcomes.

- This has implications on how to approach investigations into these differences.

Morbidity

- Neonatologists measure certain morbidities and a gauge of quality care.
- Morbidities: chronic lung disease, airleaks (pneumothorax), nosocomial sepsis, severe intraventricular hemorrhage, Periventricular leukomalacia, Necrotizing enterocolitis, severe Retinopathy of prematurity.
- Babies without these combined morbidities: morbidity-free survival.
- Additional Morbidities: death or CLD, home in O2, ROP treatment, discharged with G-tube.

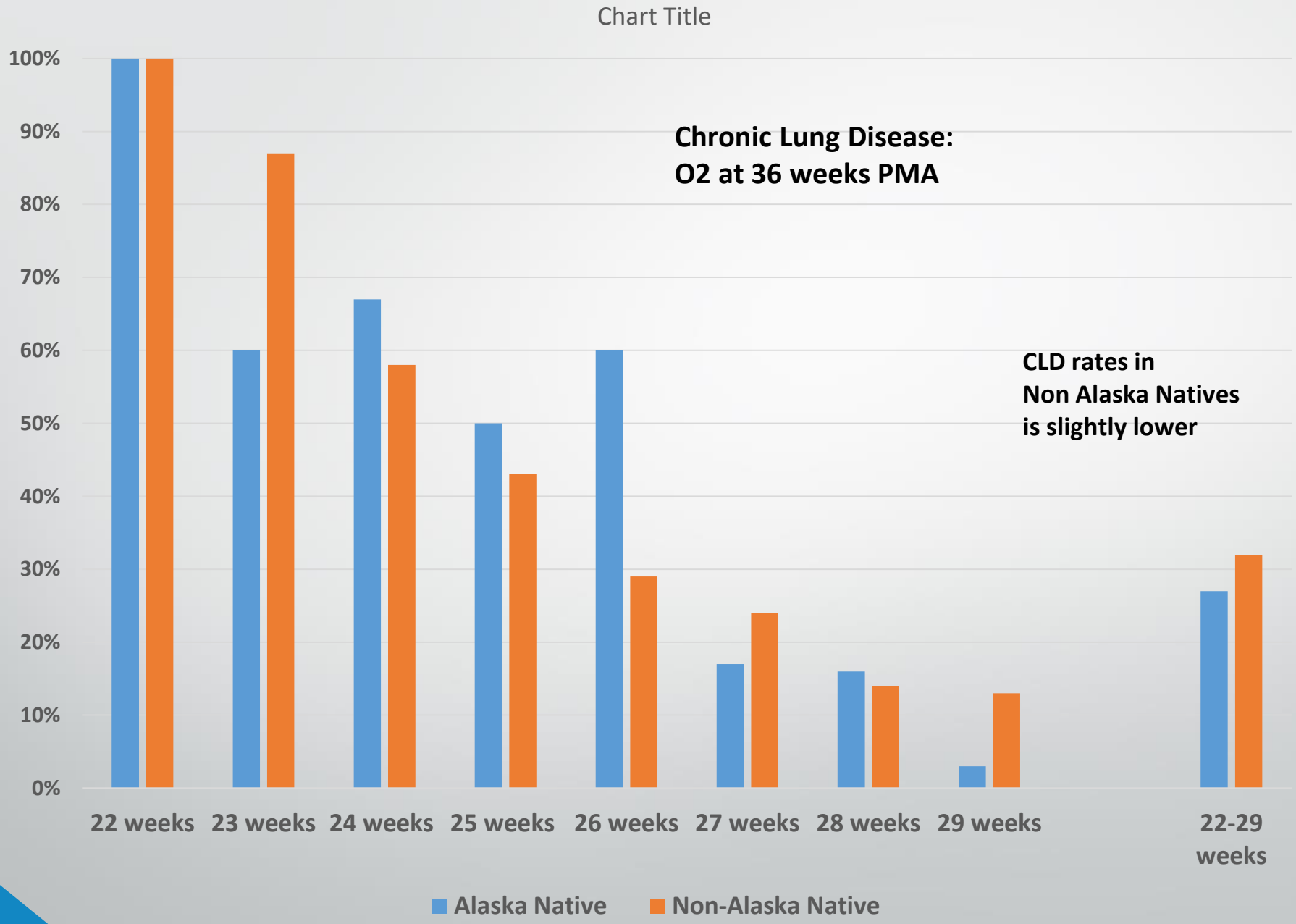
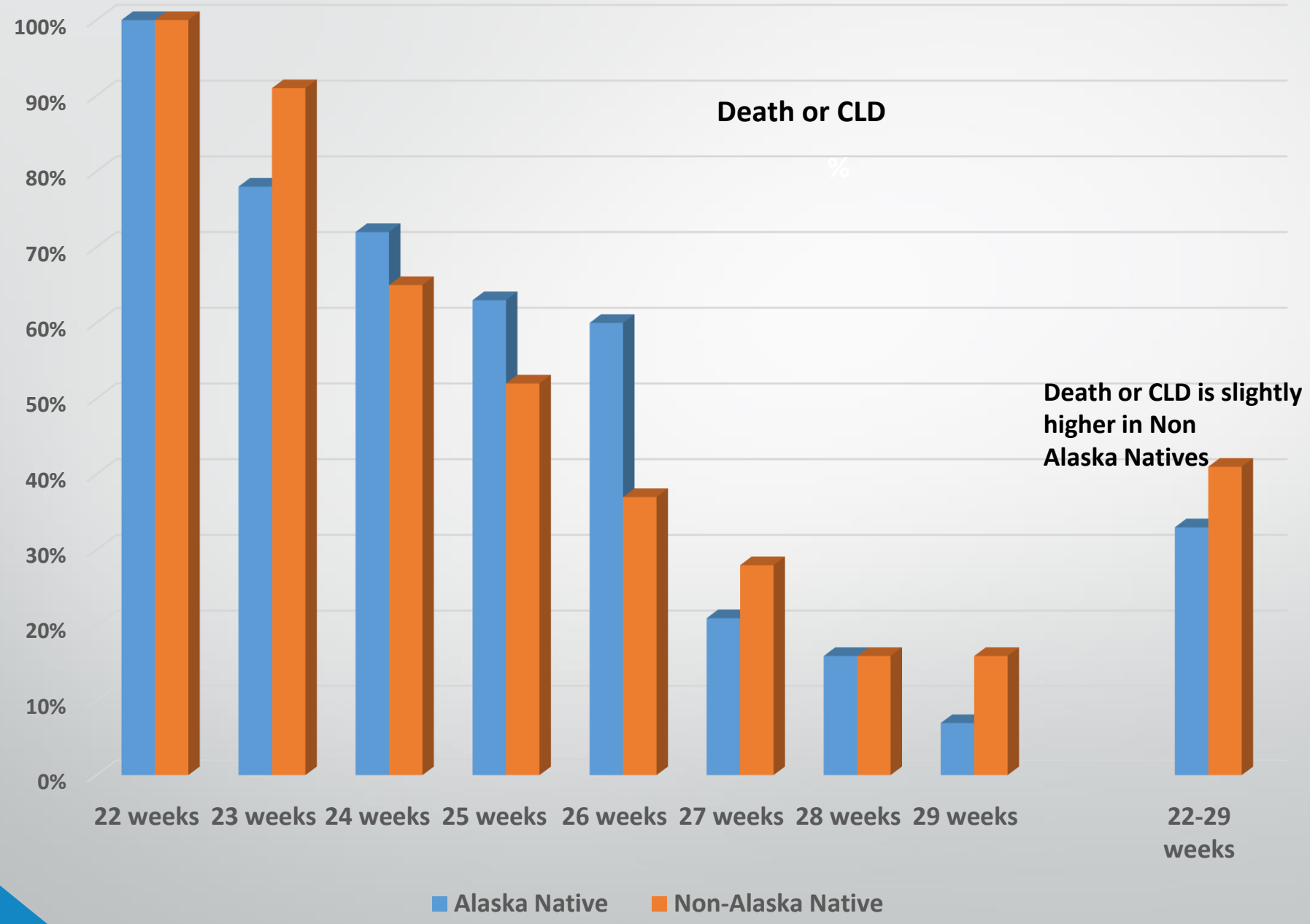
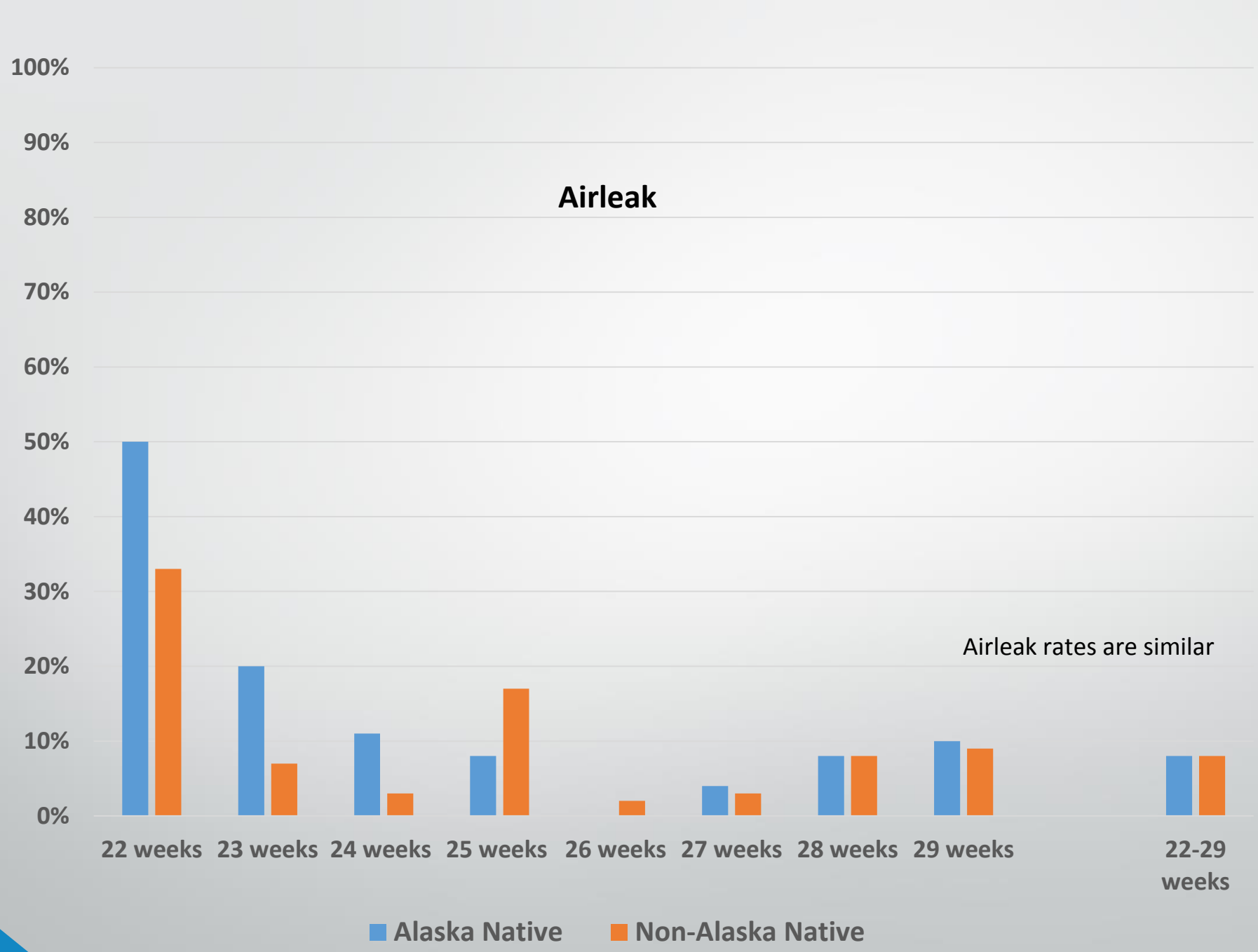
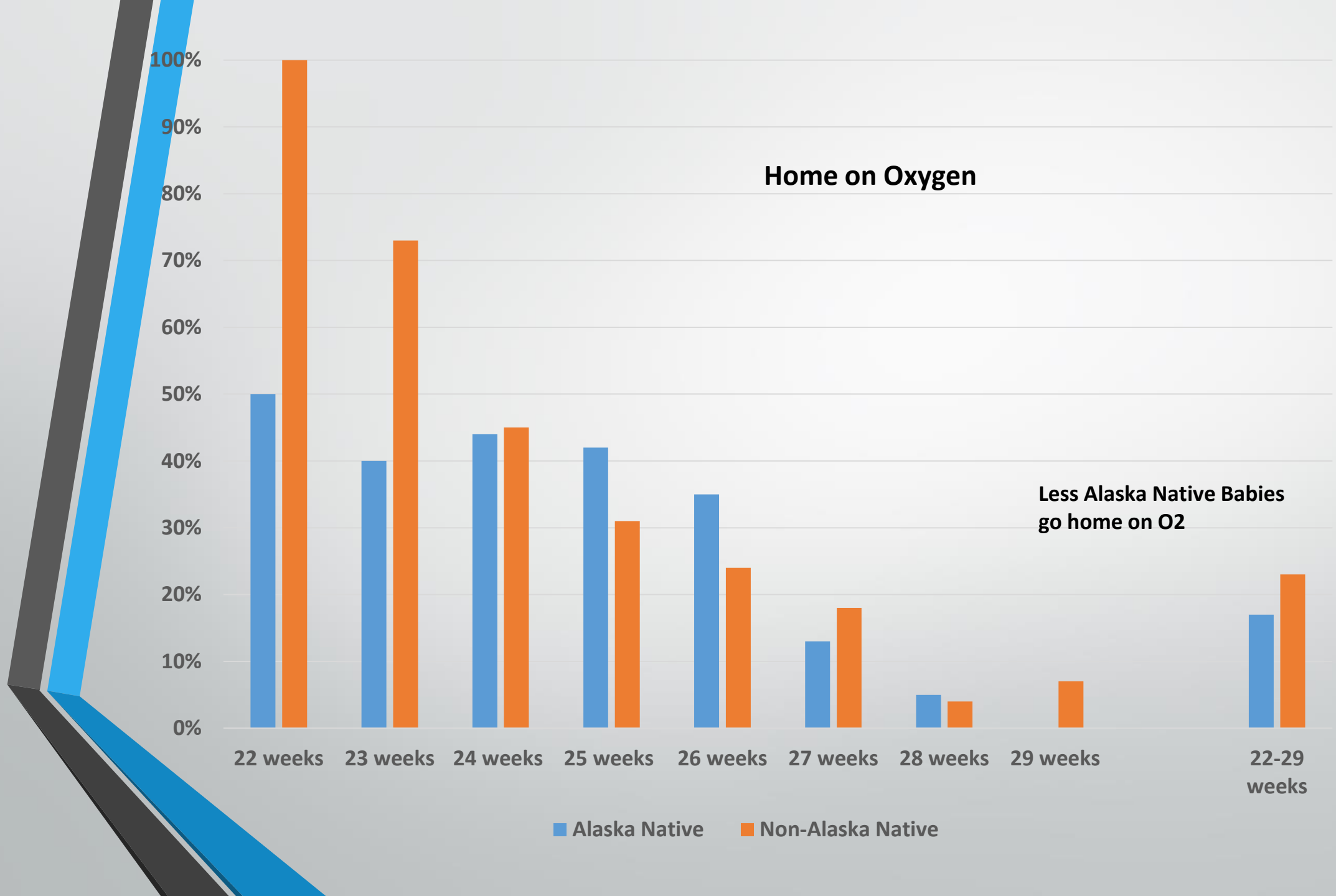
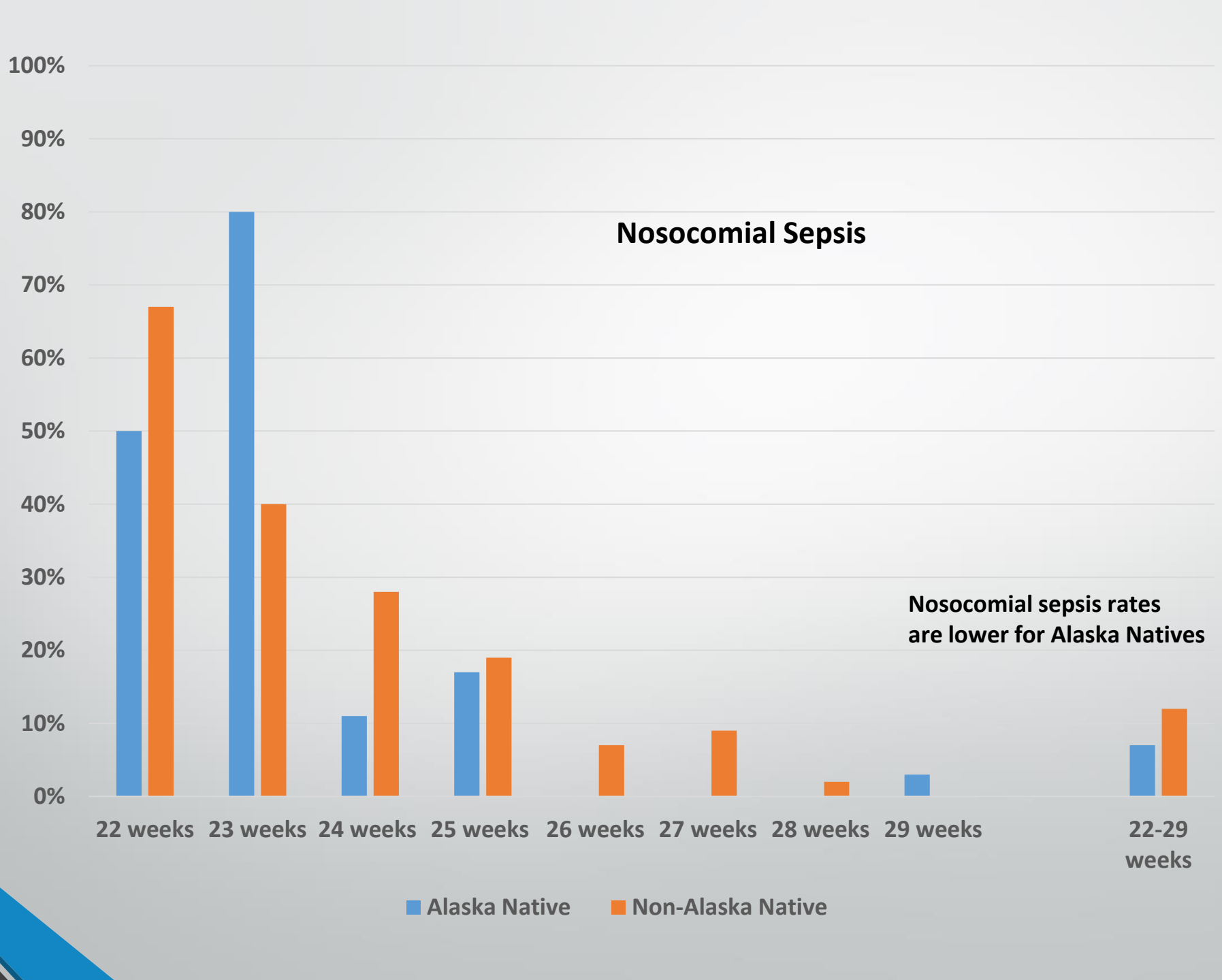


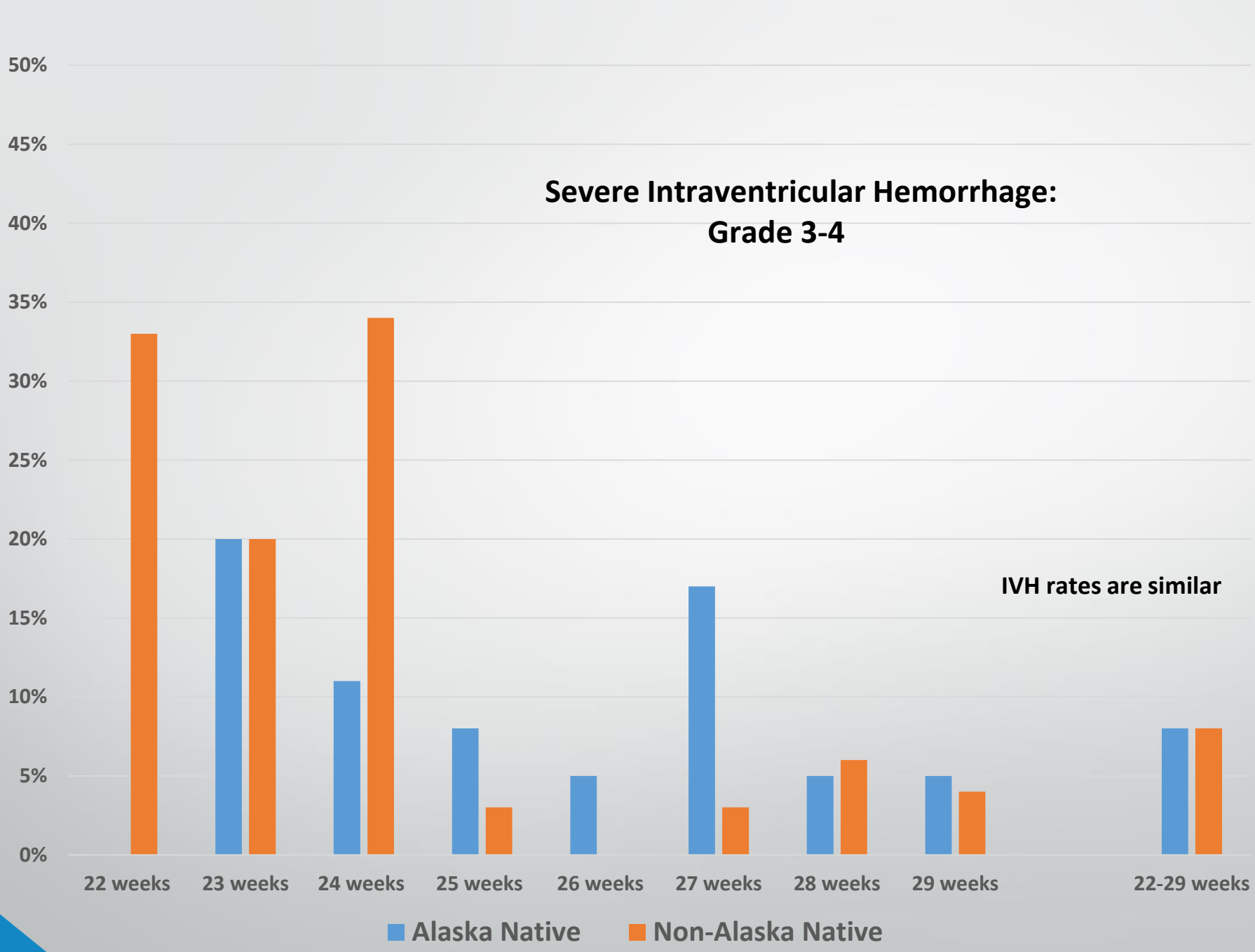
Chart Title
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Chronic Lung Disease:
O2 at 36 weeks PMA
CLD rates in
Non Alaska Natives
is slightly lower
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native

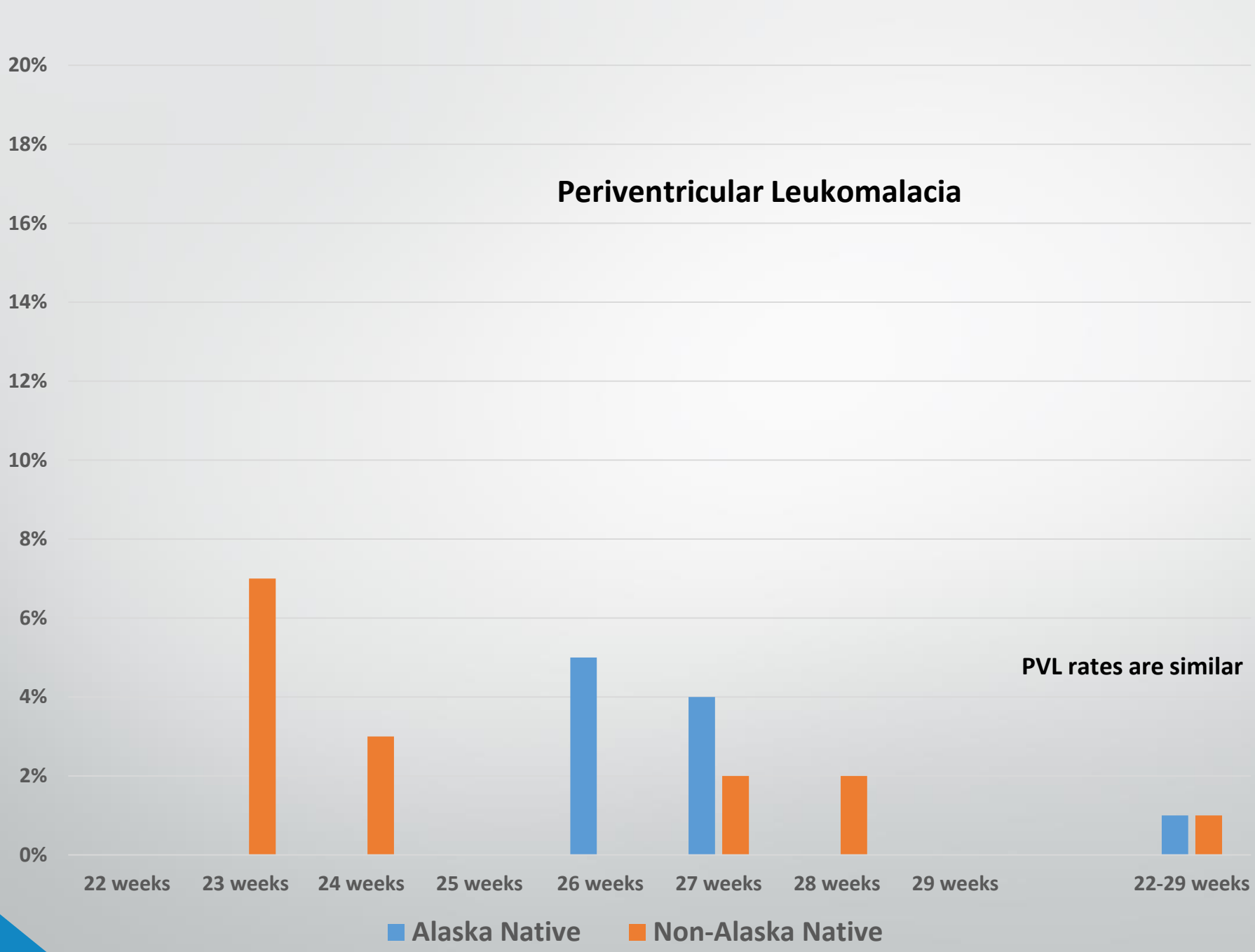

Death or CLD
%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Death or CLD is slightly higher in Non Alaska Natives
Alaska Native
Non-Alaska Native

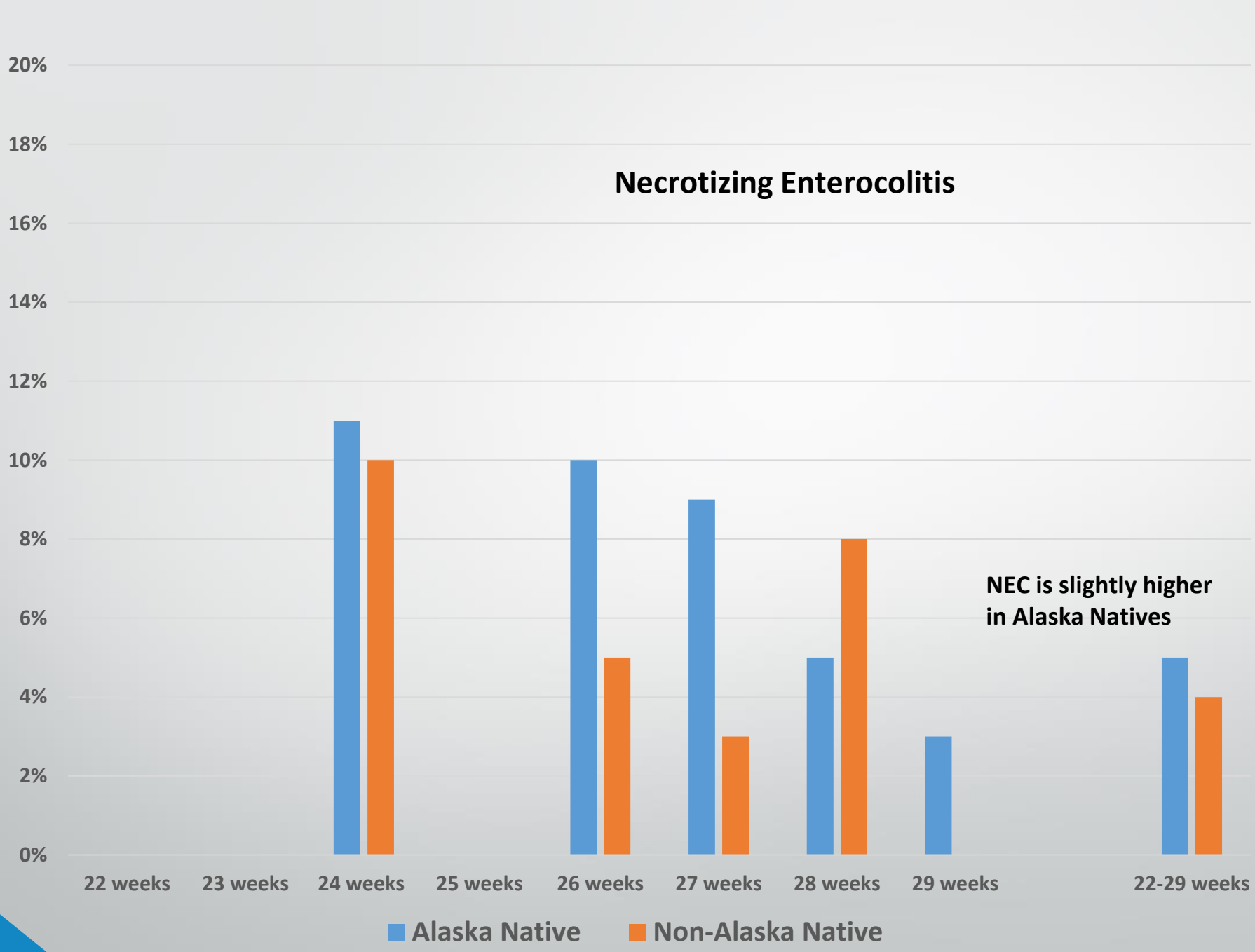

Airleak
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native
Airleak rates are similar

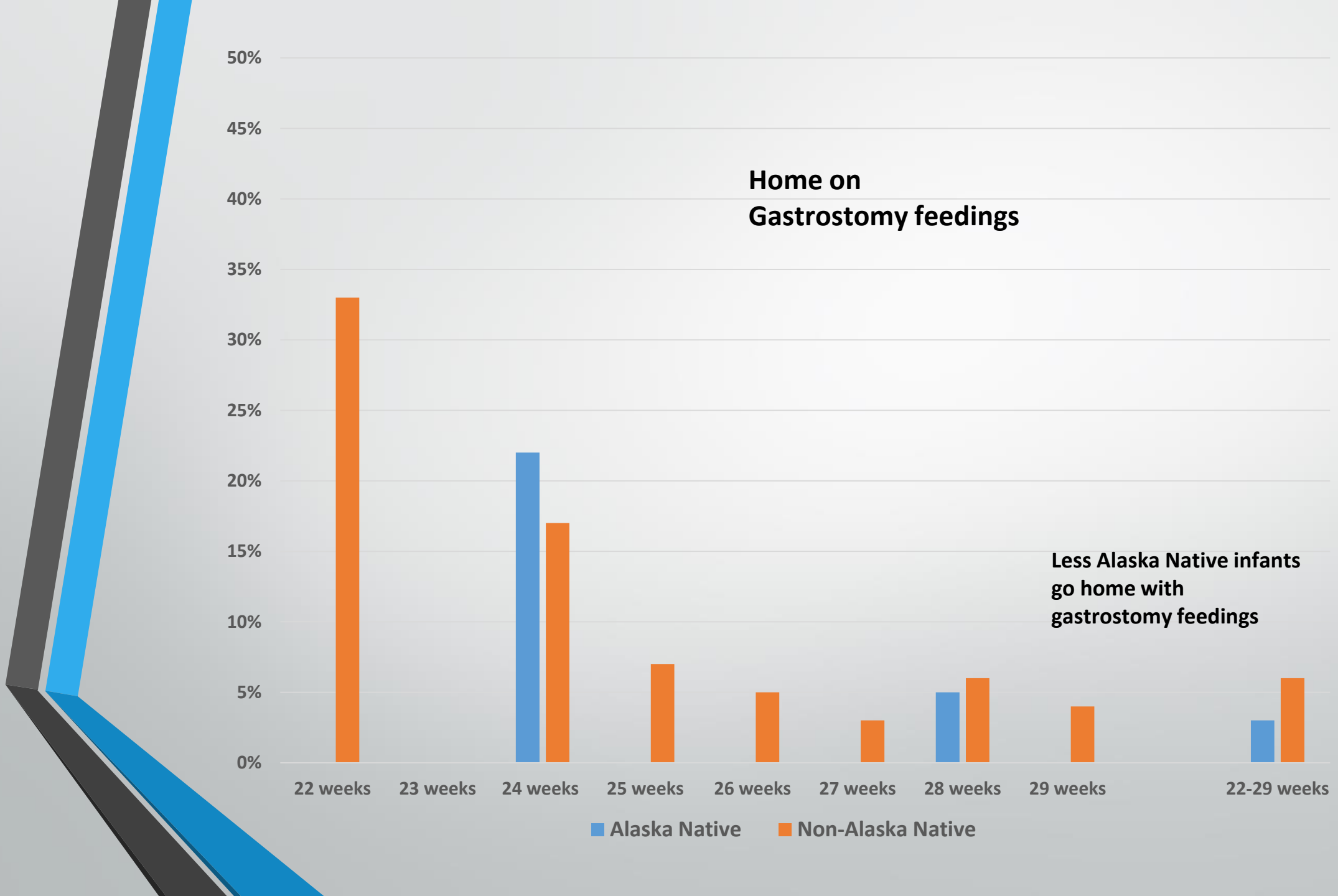

Home on Oxygen
Less Alaska Native Babies go home on O2
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native

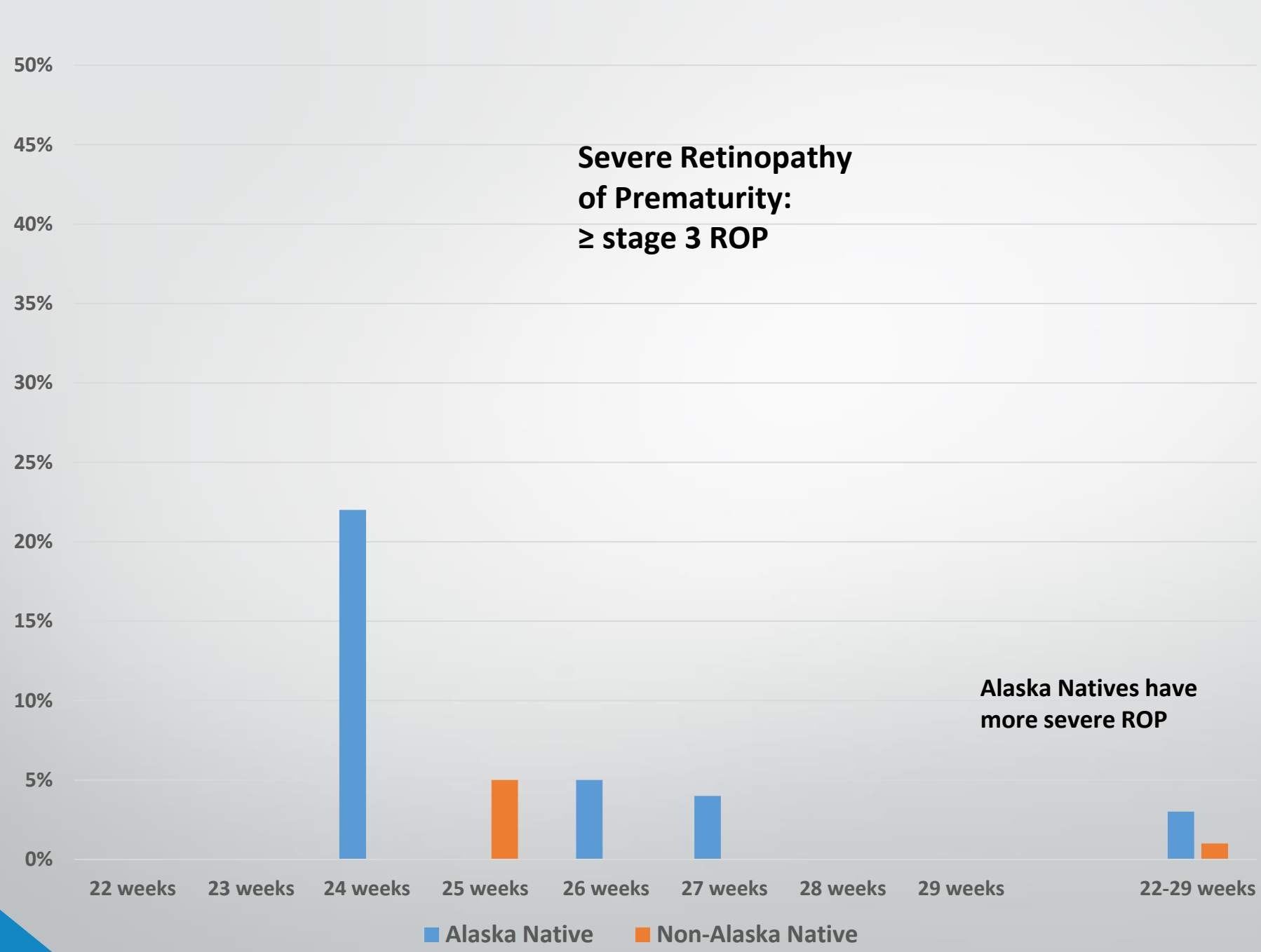

Nosocomial Sepsis
Nosocomial sepsis rates are lower for Alaska Natives
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native

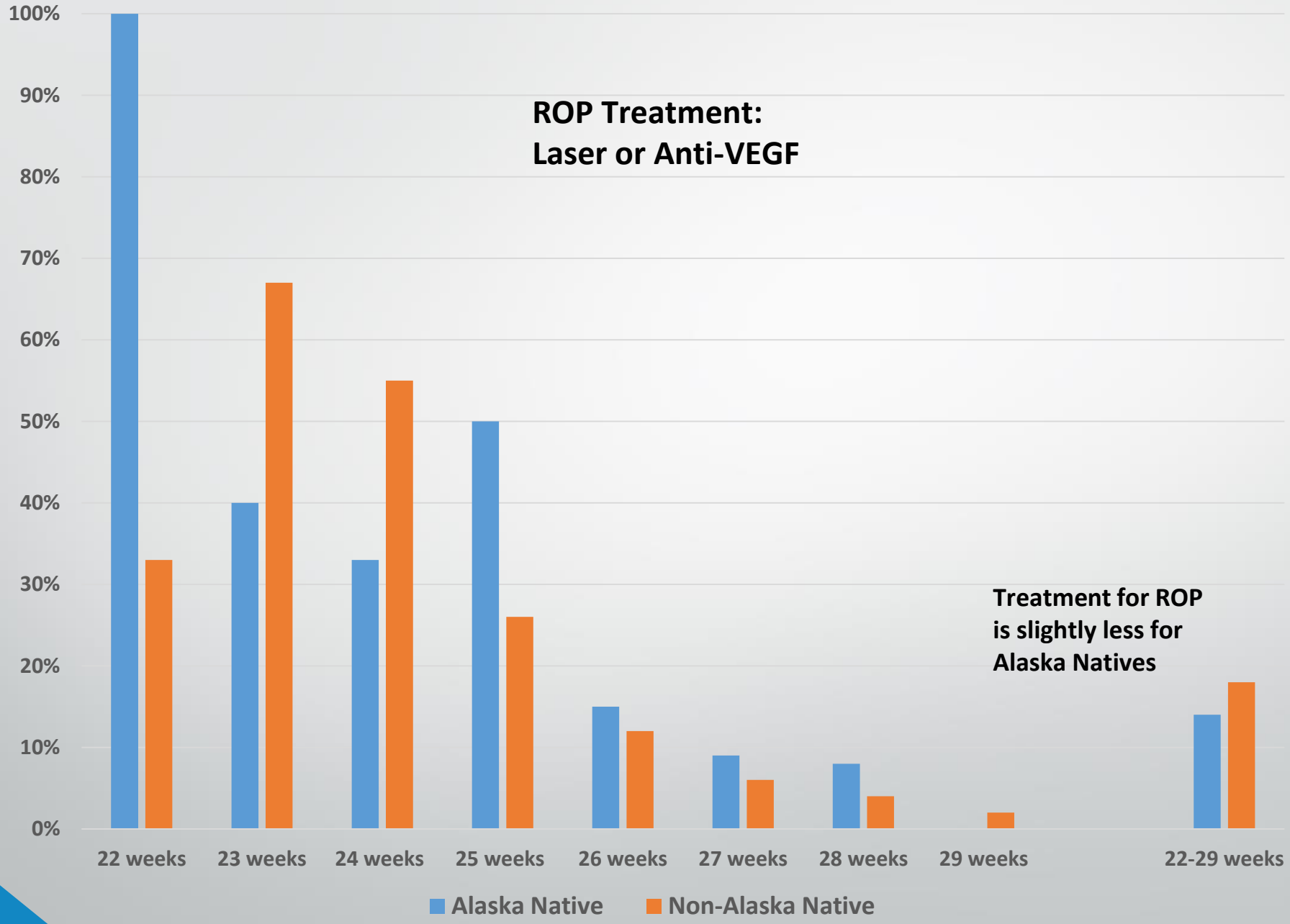

Severe Intraventricular Hemorrhage:
Grade 3-4
IVH rates are similar
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native

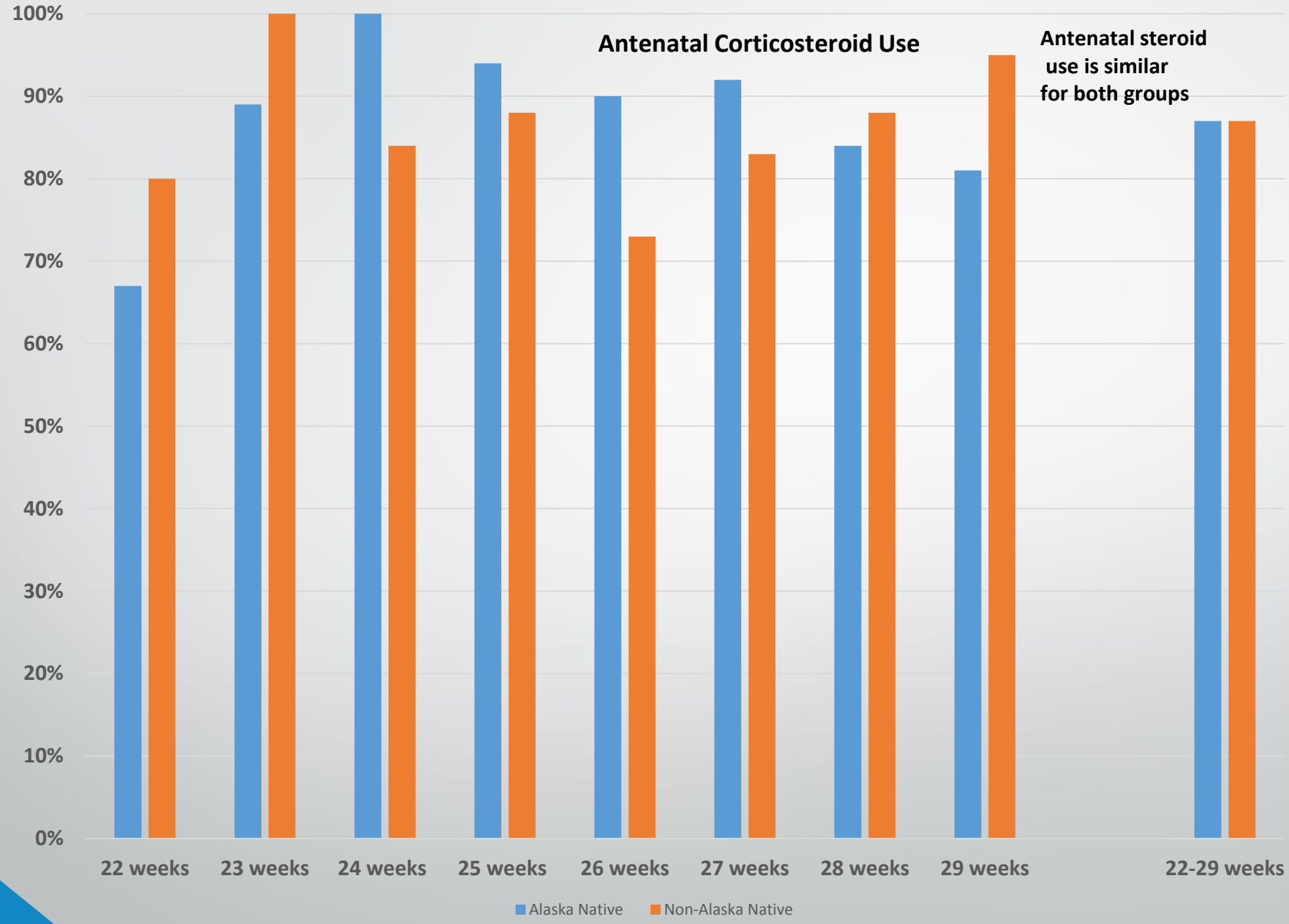

Periventricular Leukomalacia
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
PVL rates are similar
Alaska Native
Non-Alaska Native

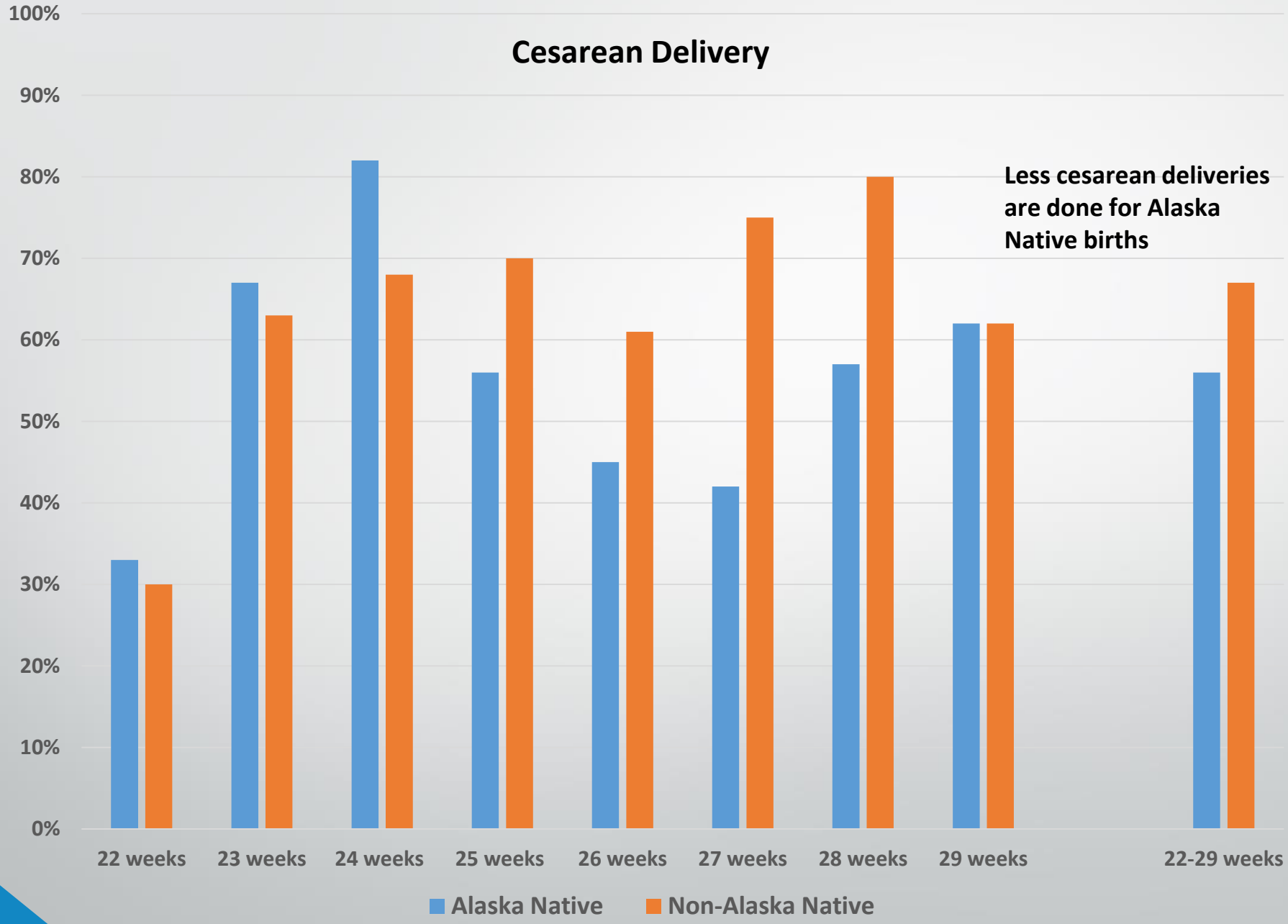

Necrotizing Enterocolitis
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
NEC is slightly higher in Alaska Natives
Alaska Native
Non-Alaska Native

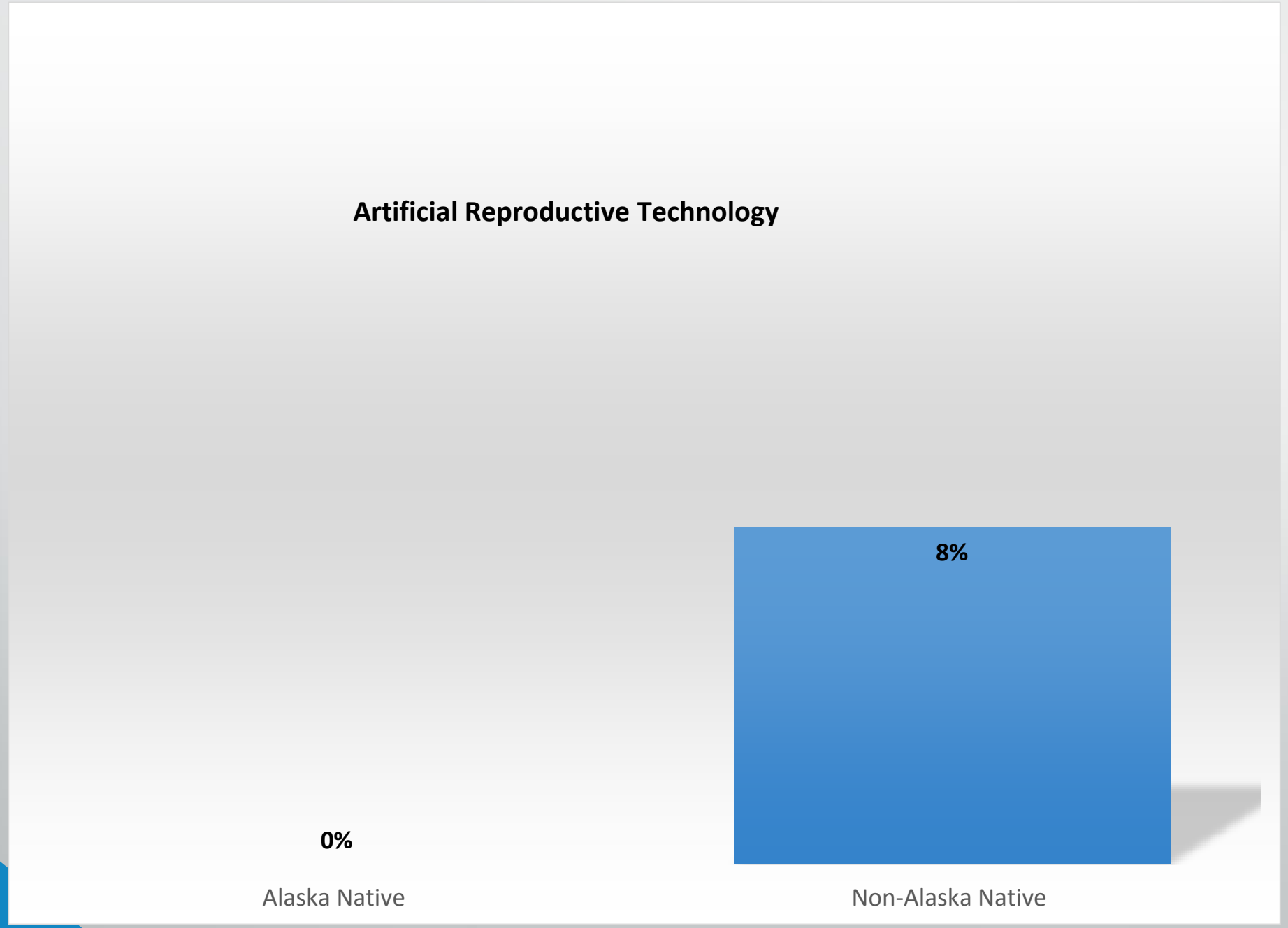

Home on
Gastrostomy feedings
Less Alaska Native infants go home with gastrostomy feedings
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native

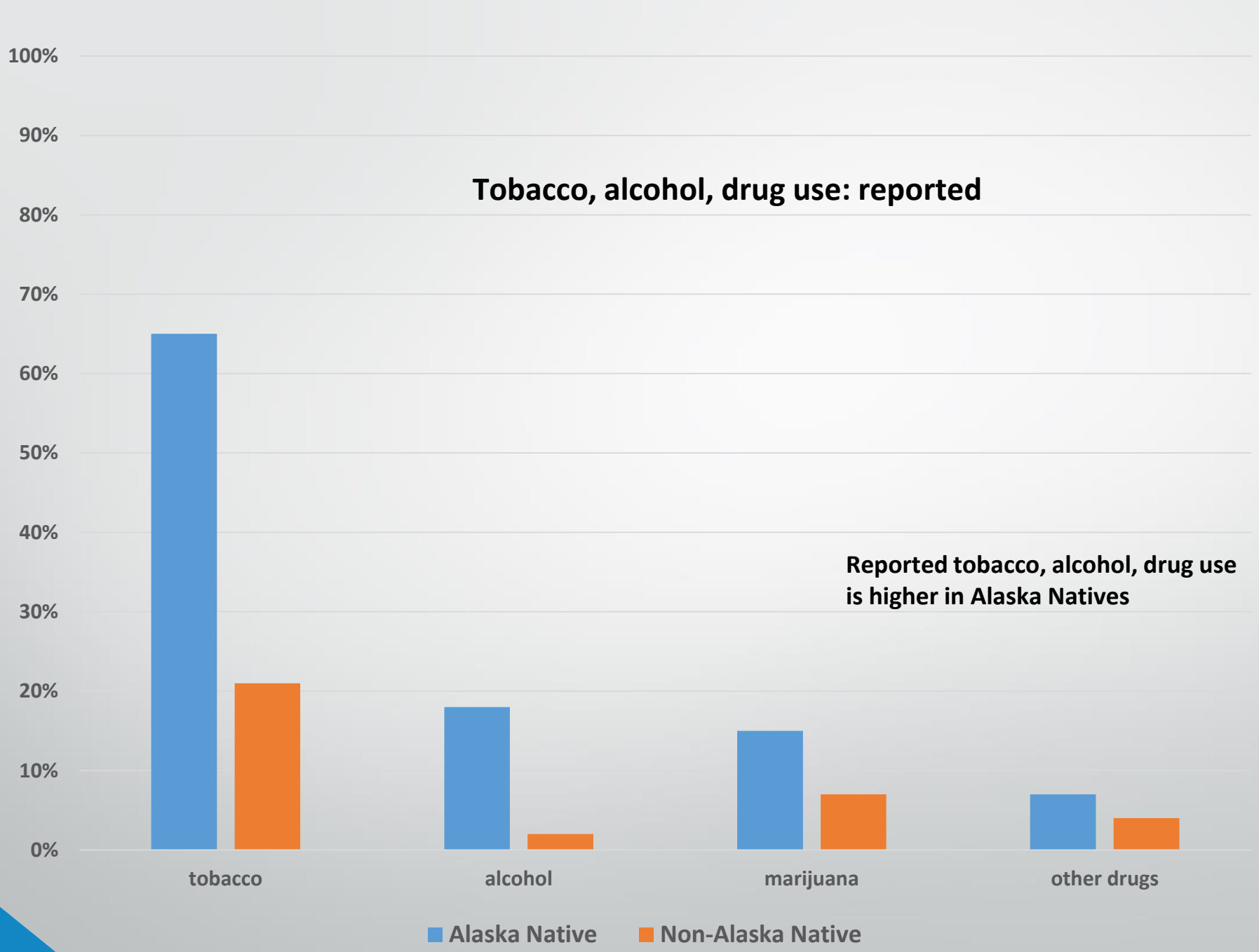

Severe Retinopathy of Prematurity: ≥ stage 3 ROP
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native
Alaska Natives have more severe ROP

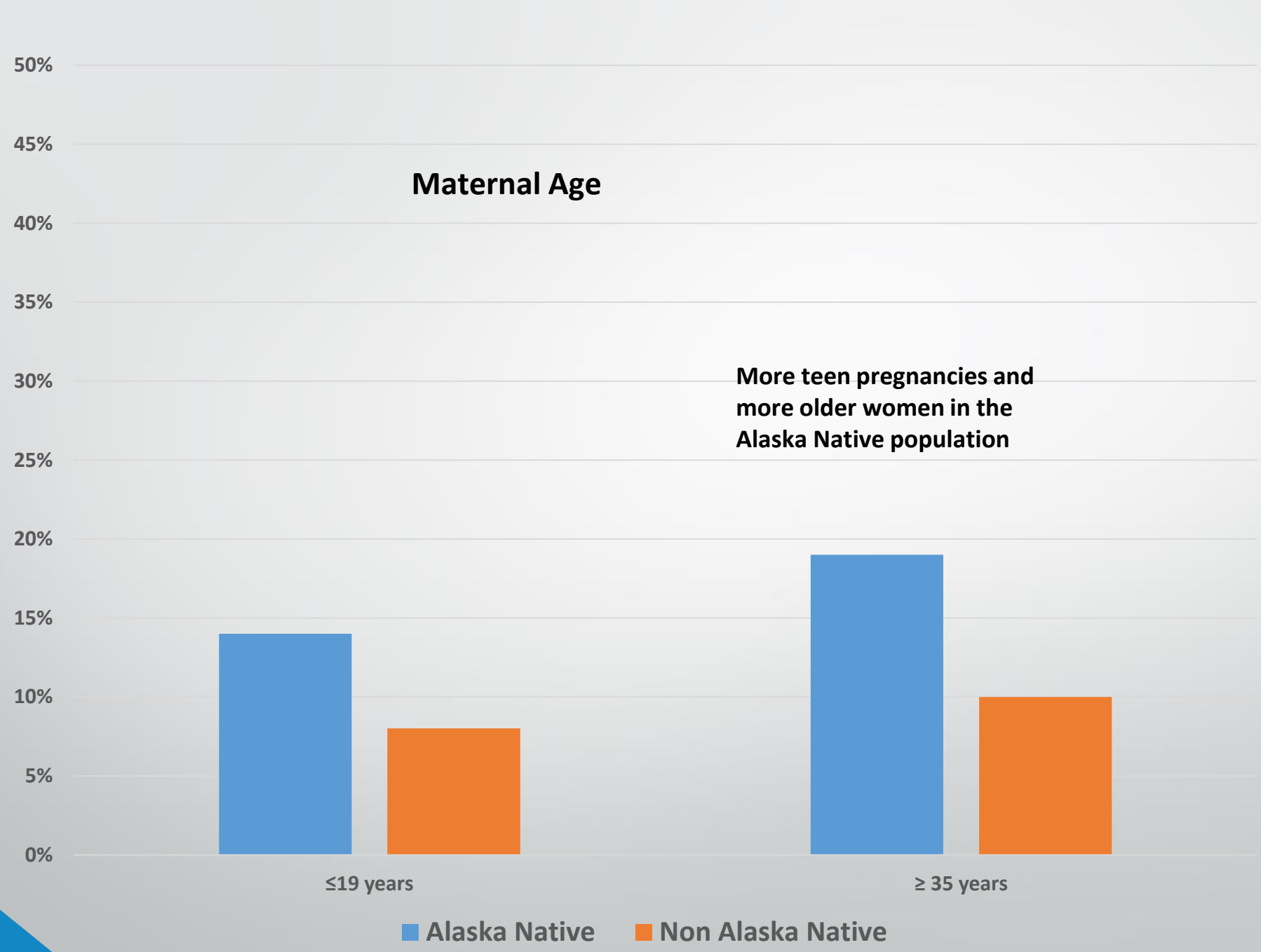

ROP Treatment:
Laser or Anti-VEGF
Treatment for ROP is slightly less for Alaska Natives
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native


Antenatal Corticosteroid Use
Antenatal steroid use is similar for both groups
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native


Cesarean Delivery
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
22 weeks
23 weeks
24 weeks
25 weeks
26 weeks
27 weeks
28 weeks
29 weeks
22-29 weeks
Alaska Native
Non-Alaska Native
Less cesarean deliveries are done for Alaska Native births


Artificial Reproductive Technology
0%
8%
Alaska Native
Non-Alaska Native


Tobacco, alcohol, drug use: reported
Reported tobacco, alcohol, drug use is higher in Alaska Natives
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
tobacco
alcohol
marijuana
other drugs
Alaska Native
Non-Alaska Native


50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Maternal Age
More teen pregnancies and more older women in the Alaska Native population
≤19 years
≥ 35 years
Alaska Native
Non Alaska Native

Thanks for the opportunity to present

Questions?