



# Thinking Zinc — *Béésh Doot'izh Bantsáhákees*

*A study to assess how taking the recommended daily amount of zinc may help repair damage from harmful metals among Navajo Nation residents*



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# Funding, Disclosures, Disclaimer, Approvals



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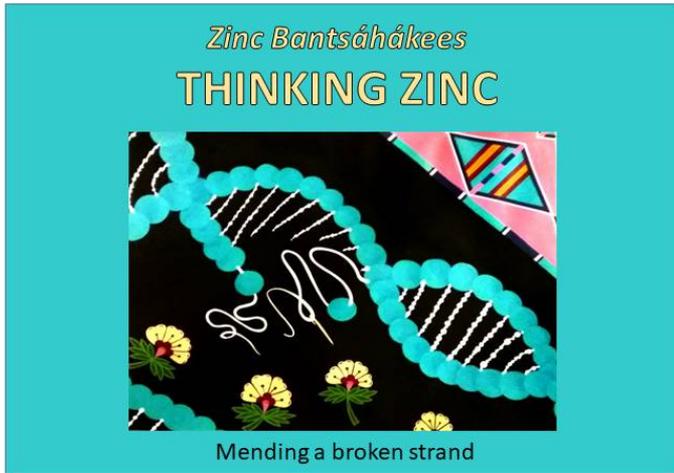
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## Approvals:

*Human research is monitored and approved by UNM Human Research Protections Office (HRPO), the Navajo Nation Human Research Review Board (NNHRRB) and the New Mexico Cancer Care Alliance, as required by federal, state and Tribal law. **UNM HRPO approved Thinking Zinc on December 11, 2018 (HRPO #18-381). NNHRRB approved the study on January 22, 2019 (#NNR-18.330T).***

*Staff and collaborator acknowledgements on slide 14.*



### Research volunteers needed

We are conducting research to understand if taking the daily recommended level of zinc protects our bodies from the effects of heavy metals in the environment.

#### To participate you are:

- 21-64 years
- Not diabetic
- Not allergic to zinc
- Not pregnant or nursing

#### You will:

- Have 4 study visits over 9 months
- Take a zinc supplement tablet
- Provide blood and urine samples
- Receive a gift card each visit

### INTERESTED?

For more information or to participate, send email to [zinc@src.org](mailto:zinc@src.org), call 877-545-6775, or visit [www.src.org/Zinc](http://www.src.org/Zinc)



# Thinking Zinc — *Beesh Doot'izh\* Bantsáhákees* [metal + blue (the one that is) + thinking about it]

- This study will be conducted in the Blue Gap-Tachee Chapter and Red Water Pond Road area of the Navajo Nation, 2018-2021
- Blue Gap-Tachee Chapter adopted resolution supporting its participation in the Zinc Study in October 2017, reaffirmed in November 2018
- Red Water Pond Road Community supported UNM METALS Center in 2014 and 2016, adopted a resolution of support in May 2018
- Enrollment and sample collections beginning in May 2019

***Community review and comment on these outreach and educational materials are always welcomed!***

\*From "Code Talker" by Chester Nez and Judith Schiess Avila, 2011.



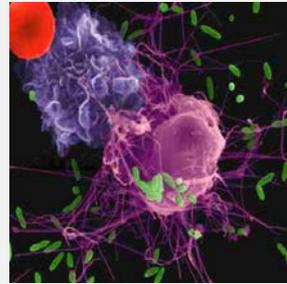
**We are concerned about exposure to some metals, especially uranium and arsenic, because they can damage your health. Here are some examples:**



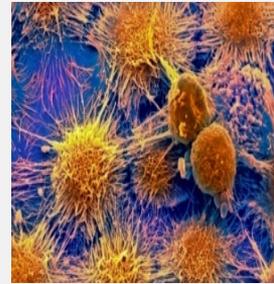
**Kidney disease**



**Cardiovascular  
Disease**



**Immune Disorders**



**Cancers**



**Skin Problems**



## Indigenous perspective

This painting shows how metals like uranium  can damage DNA and cells, through the lens of Mallery Quetawki, a Zuni artist and biologist.

## Indigenous perspective

In this painting, Ms. Quetawki shows how DNA damage may be repaired, like re-stringing a broken bead strand. Zinc is necessary for this process.

Painting by Mallery Quetawki, Zuni Pueblo





# Why take zinc?



- In the right amounts, zinc — a metal that comes from Mother Earth — is an *essential nutrient* that promotes good health.
- Studies have shown that many people do not get enough zinc in their diet to keep their body healthy, to achieve balance.
- Some Navajo women and men enrolled in the Navajo Birth Cohort Study were found to have insufficient levels of zinc.
- Taking a zinc pill is NOT a cure-all for all your ailments, and too much zinc may be harmful.
- Taking a zinc supplement at the recommended daily allowance of 11 milligrams zinc per day is considered safe.

# Is zinc in our diets?



- Yes, but it might not be in high enough amounts
- Some Navajo foods that have higher levels of zinc include:
  - Lamb
  - *Blue corn mush with juniper ash*
  - Pinon nuts
  - Chicken
  - Beef
  - Eggs



Sarah Henio-Adeky (left) serves blue corn mush at Thinking Zinc table at Red Water Pond Road Community gathering, July 2019



# Beesh Doot'izh Bantsáhákees Eligibility\*



## Research volunteers needed

We are conducting research to understand if taking the daily recommended level of zinc protects our bodies from the effects of heavy metals in the environment.

### \*To be eligible, you must be

- 21-64 years of age
- Not diabetic
- Not allergic to zinc
- Not pregnant or nursing

### You will:

- Have 4 study visits over 9 months
- Take a zinc supplement tablet
- Provide blood and urine samples
- Receive a gift card each visit

*Your eligibility to be enrolled in the study will be determined at your first visit to a community collection event.*

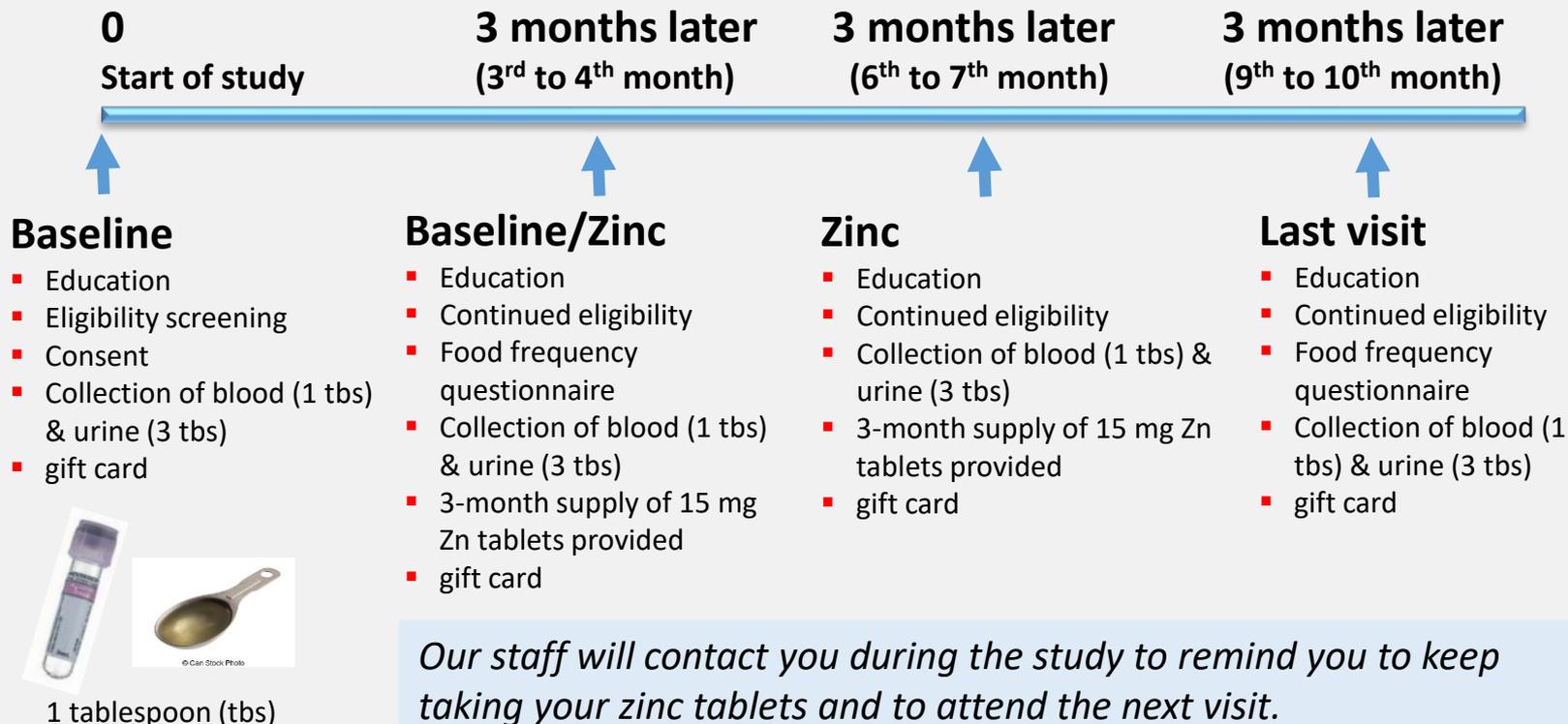
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# Thinking Zinc Study Timeline



# Status and Progress



- Approvals
  - Navajo HRRB January 2019; UNM HRPO December 2018
  - Registration: Clinicaltrials.gov NCT03908736
- Continued Community Engagement (CEC/SRIC)
  - >50 community activities (i.e. chapter meetings, booths at events, collection days)
- Enrollment (38 of 80 goal as of February 2020)
  - 24 women, 14 men, ages 21-64, median 59
  - First enrollment, sample collection in Red Water Pond Road Community, May 2019
- COVID-19 study pause, March 2020-July 2021
- Sample analyses and data reports —in progress
- *Resuming study August 2021*



Pinedale Chapter House  
collection event, June 2019

# Preliminary Data on Metals Levels in Urine



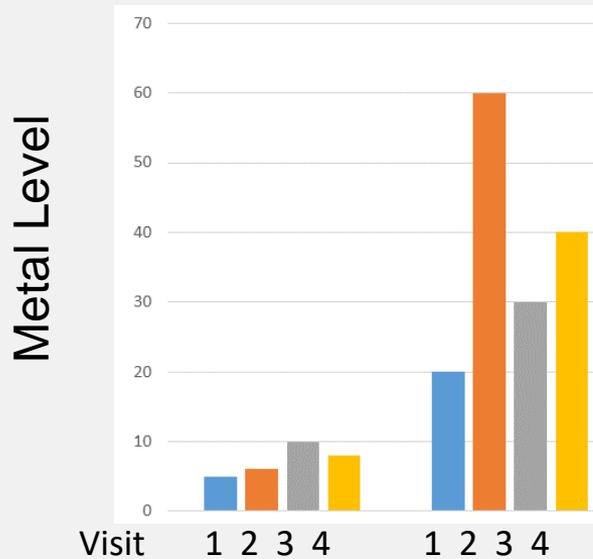
**Table 3. Thinking Zinc Participant Pre-Zinc Urinary Metal Levels**

Metal	PPB Median	Range	%<LOD	%>95 <sup>th</sup> percentile NHANES/NBCS	NHANES 50 <sup>th</sup>	NHANES 95 <sup>th</sup>	NBCS 50 <sup>th</sup>	NBCS 95 <sup>th</sup>
Antimony	0.11	LOD – 0.398	5%	16.7%/8.3%	0.044	0.191	0.064	0.32
Arsenic	6.097	0.48 – 142.97	0%	3.3%/6.7%	5.74	49.9	3.6	16.9
Barium	1.53	LOD – 151.69	1.7%	5%/1.7%	1.17	5.39	2.375	16.25
Beryllium	LOD	LOD – 0.021	70%	30%/11.7%	LOD	LOD	0.008	0.01
Cadmium	0.20	0.029 – 1.27	0%	5%/11.7%	0.179	1.08	0.072	0.6
Cesium	3.87	0.99 – 24.84	0%	6.7%/11.7%	4.19	11.4	3.205	9.305
Cobalt	0.60	0.056 – 4.64	0%	6.7%/3.3%	0.403	1.41	0.61	2.3
Lead	0.149	LOD - 2.211	1.7%	3.3%/6.7%	0.32	1.38	0.22	0.9205
Manganese	0.126	LOD – 2.98	18.3%	21.7%/0%	0.13	0.28	0.21	3.265
Molybdenum	32.95	LOD – 160.5	1.7%	6.7%/3.3%	35.9	124	37.7	140
Platinum	LOD	LOD – 0.122	63.3%	28.3%/28.3%	.009	.017	.005	.018
Strontium	127.27	9.67 – 1075.76	0%	23.3%/8.3%	97.5	299	110	500
Tin	1.04	0.067 – 55.30	0%	15%/8.3%	0.43	3.62	1.36	11.22
Tungsten	0.0345	LOD – 0.431	15%	1.7%/0%	0.059	0.321	0.093	0.69
Uranium	0.022	LOD – 6.65	3.3%	36.7%/20%	0.005	0.031	0.011	0.07
Vanadium*	0.13	0.061 – 10.00	0%	-----	n/a	n/a	n/a	n/a

Median metal levels are shown for Visit 1 and Visit 2 samples (n=60) collected before zinc supplementation. Values are in micrograms per liter (ppb), and are uncorrected for creatinine to compare NHANES values. LOD=limit of detection. For reference, the 50th and 95th percentile levels are provided for NHANES values and participants in the NBCS including women, men and babies (N=1661-1782 for each metal). Metals results highlighted in blue represent those where more than 10% of samples had levels in excess of the NHANES 95th percentile values. \*Urine levels for vanadium are not included in NHANES reporting. Nixon et al (2002) reported normal urine vanadium levels to be 0.24 ppb [Nixon DE et al. 2002]. 41% of participants had urine V levels > 0.24 ppb.

- Data Table – example of the detailed information comparing urine-metals levels in Thinking Zinc participants with national values and values in NBCS participants
- Some *overall results* so far:
  - **Arsenic** is *similar* to national values
  - **Lead** is *below* national values
  - **Uranium** is about *4 times higher* than national values
- *We will provide metals information for each participant in Thinking Zinc*

# Different patterns of exposure over time



Upcoming: Report-back letters to each participant who completed 4 visits will be sent in August 2021

- Some people have *small changes* in metal levels between visits (bars on left side of chart).
- Some people have *much bigger changes* in metal levels between visits (bars on right side of chart).
- *We will find out whether there are activities that might cause the differences so people can find ways to modify their exposure risk.*

# Ahéhee' – Thank You!

## Acknowledging Community Partners



**Blue Gap-Tachee Chapter, Tachee Uranium Concerns Committee** (Faith Baldwin, Nadine Begay, Sadie Bill, Johnny Naize, Christopher Nez, Helen Nez, Seraphina Nez, Marcus Tulley, Aaron Yazzie)



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