Cancer Disease Burden and Health Equity

Methodology that is transparent, simple, an accurate portrayal of greatest need for intervention and resources

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Nebraska DHHS Cancer Prevention and Control Programs

Who are we- Together The Cancer Prevention & Control Programs support the achievement of the following cancer prevention and control goals: eliminating preventable cancers, ensuring all people get the right screening at the right time for the best outcome, and supporting cancer survivors in a manner that allows them to live longer, healthier lives.

1) **Every Woman Matters** (Nebraska Breast and Cervical Cancer Early Detection Program (NBCCEDP)), which supports clinical services for women with lower incomes who are uninsured or underinsured and implementation of evidence-based interventions in the clinics and communities that serve them.

2) **Nebraska Comprehensive Cancer Control Program (NE CCCP)**, which supports cancer partnership efforts to plan and implement evidence-based strategies as described in the Nebraska Cancer Plan.

3) **Nebraska Cancer Registries (NCR)**, which implements and maintains a population-based cancer registry program to monitor and report cancer burden in the state.

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Aligning Work

Why do we need to do this work

- ➤ Requirement of the funder (CDC)
  - ▸ Focus on Disease Burden
  - ▸ Health Disparities and Health Equity
  - ▸ Assessment and Mitigation of Structural Barriers
  - ▸ Increase in cancer screening numbers
  - ▸ Utilization of financial resources in areas that will have greatest impact

- ➤ Aligns with DHHS Priorities and Values
  - ▸ Efficiency and Effectiveness
  - ▸ Public Safety
  - ▸ Simplicity
  - ▸ Transparency
  - ▸ Accountability

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Methodology: Cancer Disease Burden and Health Equity Scoring (Breast, Cervical, and Colon Cancer)

How do/should we do this work

Considerations:
- ➢ Easy
- ➢ Based on real data
- ➢ Simple/clear to all audiences
- ➢ Adhere to data sharing policies
- ➢ Useable

Resources:
- ➢ NE BRFSS
- ➢ NE Cancer Registry Data
- ➢ **CDC** Interactive Atlas of Heart Disease and Stroke
- ➢ Census Data

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Methodology: Cancer Disease Burden
(Breast, Cervical, and Colon Cancer)

How do/should we do this work

Primary Resources:
- NE BRFSS
- NE Cancer Registry Data

Cancer Data Indicators used:
- Screening rates
- Incidence rates
- Mortality rates
- Late stage disease rates
- Significance testing

Data tables generated by geographic areas or populations:
- LHD
- Zones/census tracts in Douglas, Lancaster, and Sarpy counties
- Race and Ethnicity,
- Urban /Rural based on population

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Methodology: Cancer Disease Burden Scoring (Breast, Cervical, and Colon Cancer)

How do/should we do this work

Cancer Data sets were compiled and sorted by Cancer indicators within geographical areas or populations.

Each cancer indicator was then sorted by severity– Bar charts used to assist in tier allocation
Tiers 1-4 were assigned based on the clustering of similar indicator rates

Scoring:
Base score started with Tier level 1-4.
Additional point was given to
- Any indicator that was of greater severity than the state rate
- Any indicator that was proven to be statistically significant
- The area/population with an indicator having the highest severity.
Scores for each cancer indicator tallied for a total disease burden score.

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Table 1. Colorectal cancer incidence and mortality in NE, 2016-2020

Incidence

Local Health Department	Number	Age Adjusted Rates	95% CI Lower	95% CI Higher	Conclusion
East Central	170	52.5	44.6	60.3	Significantly higher
Loup Basin	122	51.0	42.0	60.1	Significantly higher
Northeast	93	49.9	39.7	60.0	
South Heartland	151	48.4	40.6	56.1	
North Central	158	45.6	38.5	52.7	
Southwest	134	44.9	37.3	52.5	
Central	205	44.8	38.7	51.0	
Elkhorn Logan Valley	163	44.8	38.0	51.7	
Four Corners	129	44.5	36.8	52.2	
Dakota County	45	42.0	29.7	54.2	
Southeast	122	42.0	34.6	49.5	
Three Rivers	209	40.5	35.0	46.0	
Public Health Solutions	154	40.2	33.8	46.5	
Two Rivers	231	38.6	33.6	43.5	
Panhandle	212	36.5	31.6	41.5	
West Central	102	36.1	29.1	43.1	
Missing cases # (Due to missing county at diagnosis values)	58				
State total including missing cases	4,515	40.7	39.5	41.9	Baseline
2015-2019					
Lancaster total	608	38.3	35.2	41.3	Baseline
Lancaster missing cases #	68				
Zone 14	99	44.4	35.7	53.2	
Zone 17	132	37.6	31.2	44.0	
Zone 15	128	33.2	27.4	38.9	
Zone 16	77	33.0	25.6	40.4	

Table 4. Colorectal cancer incidence and mortality by race/ethnicity, 2016-2020

Incidence	Numbers	Age-adjusted rates	Lower 95% CI	Upper 95% CI	Conclusion
Non-Hispanic American Indians	44	68.6	48.3	88.8	Significantly higher
Hispanics	235	48.7	42.5	54.9	Significantly higher
Non-Hispanic Whites	4,030	40.7	39.4	42.0	Baseline
Non-Hispanic African American	141	37.4	31.2	43.6	
Non-Hispanic Asians/Pacific Islanders	45	27.8	19.7	35.9	Significantly lower
Total	4,515	40.7	39.5	41.9	

Mortality	Numbers	Age-adjusted rates	Lower 95% CI	Upper 95% CI	Conclusion
Non-Hispanic American Indians	27	42.6	26.6	58.7	
Non-Hispanic African Americans	127	38.8	32.1	45.5	Significantly higher
Non-Hispanic Whites	3,075	29.3	28.3	30.3	Baseline
Hispanics	60	14.7	11.0	18.4	Significantly lower
Non-Hispanic Asians/Pacific Islanders	18	12.1	6.5	17.7	Significantly lower
Total	3,307	28.7	27.7	29.7	

Table 5. Incidence and mortality rates for Colorectal cancer by area (2016-2020)

Incidence	Numbers	Age-adjusted rates	Lower 95% CI	Upper 95% CI	Conclusion
Rural area	1,181	45.0	42.4	47.5	Significantly higher
Urban small	1,066	41.4	38.9	43.9	
Urban large	2,210	37.5	36.0	39.1	Baseline
Total	4,515	40.7	39.5	41.9	

Mortality	Numbers	Age-adjusted rates	Lower 95% CI	Upper 95% CI	Conclusion
Rural area	471	16.6	15.1	18.1	Significantly higher
Urban small	408	15.0	13.6	16.5	
Urban large	775	13.2	12.2	14.1	Baseline
Total	1,654	14.3	13.6	15.0	

Snippet of Data file received from Cancer Registry. Received a file for Breast, Cervical and Colon Cancer.

Colon Cancer Scoring

	Incidence		Mortality		Late Stage		Screening		Total Disease Burden
Central	44.8	4	15.3	3	26.6	4	0.716	3	14
Dakota County	42	4	13.8	1	16.6	1	0.698	4	10
Douglas	39.8	2	13.4	1	22	2	0.759	1	6
East Central	52	7	15.8	4	28.7	5	0.689	4	20
Elkhorn Logan Valley	44.8	4	16.7	4	26.8	4	0.695	4	16
Four Corners	44	4	16.5	4	22.7	2	0.696	4	14
Lancaster	39.8	2	12	1	22	2	0.752	1	6
Loup Basin	51	6	14.4	3	28.1	5	0.68	4	18
North Central	45	4	17.5	5	25.8	4	0.667	4	17
Northeast	49.9	5	19.3	5	28.4	5	0.712	3	18
Panhandle	36.5	1	14.9	3	26.3	4	0.569	6	14
Public Health Solutions	40.2	2	16.8	4	20.4	1	0.64	5	12
Sarpy-Cass	39.8	2	14	2	24.5	3	0.782	1	8
South Heartland	48	5	14.5	3	32.6	6	0.712	3	17
Southeast	42	4	11.7	1	25.7	4	0.573	5	14
Southwest	44.9	4	18.9	5	26.9	4	0.674	4	17
Three Rivers	40	2	17.1	4	23.8	3	0.788	1	10
Two Rivers	38	1	14.6	3	20	1	0.722	3	8
West Central	36	1	15.9	4	19.5	1	0.684	4	10
	40.7		14.3		23.4		72.5		

Late Stage

Mortality

Incidence
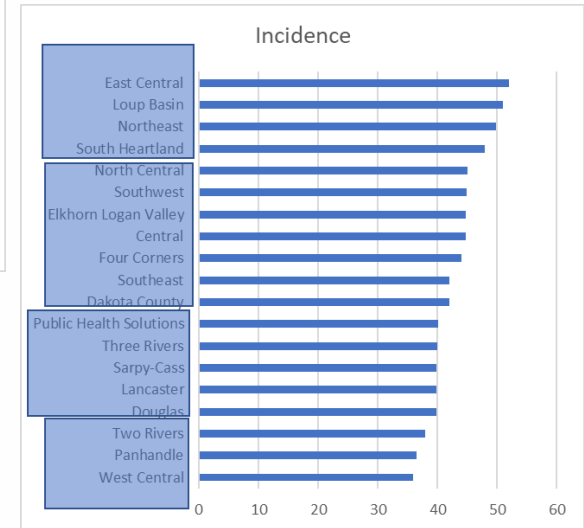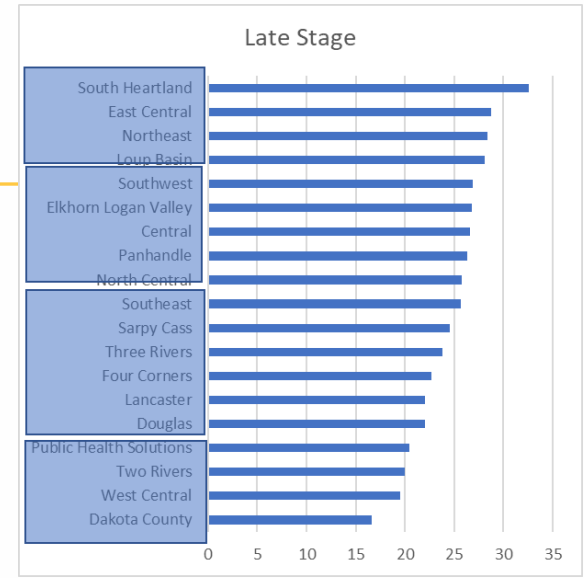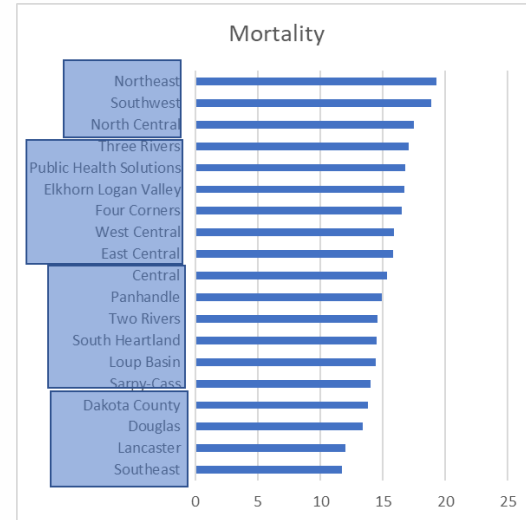
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Colon Cancer Disease Burden
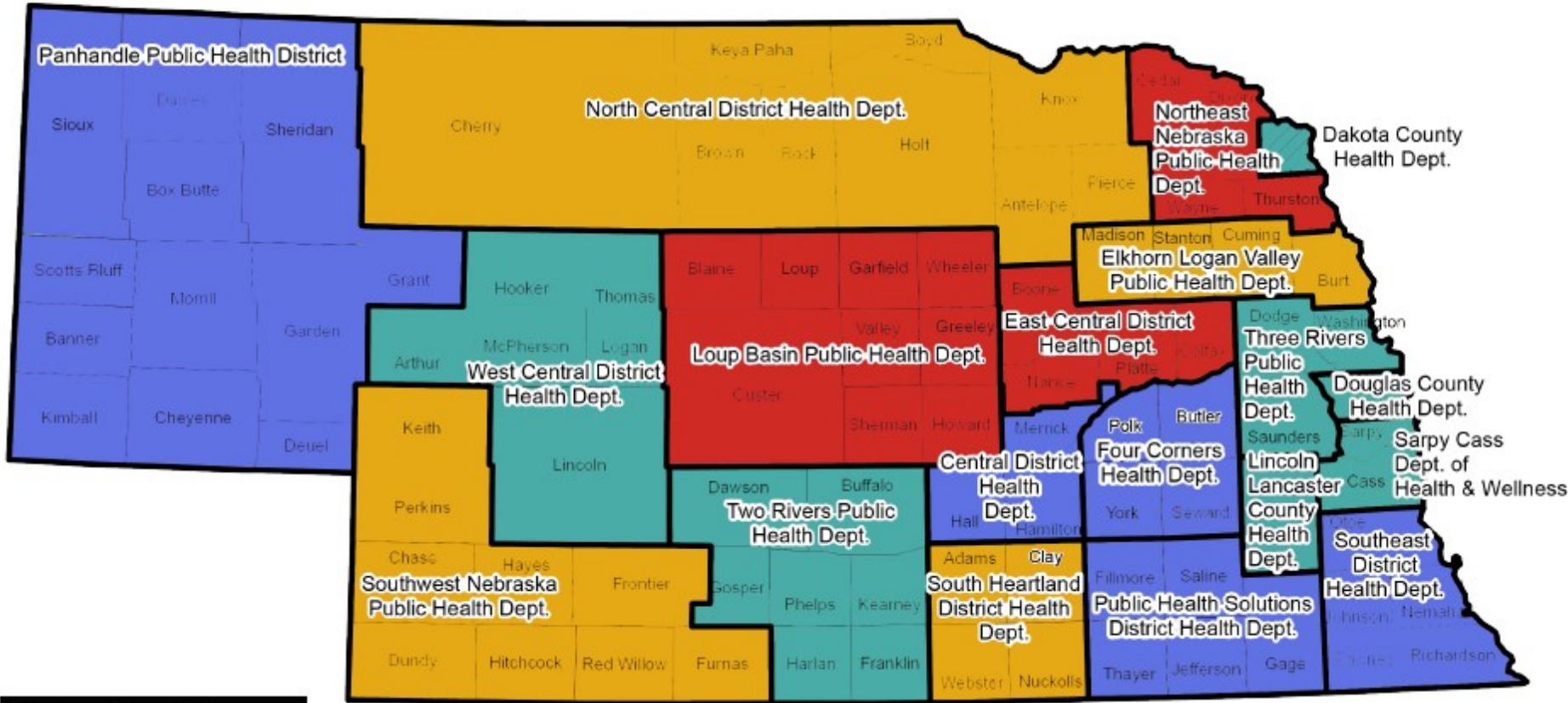
Methodology: Health Equity Scoring
(Breast, Cervical, and Colon Cancer)

How do/should we do this work

Primary Resources:
➢ **CDC** Interactive Atlas of Heart Disease and Stroke
➢ Census Data

Cancer Data Indicators used:
➢ Distribution by race and ethnicity
➢ Housing Cost Burden
➢ Uninsured rate
➢ Obesity Rates
➢ Physical Inactivity Rates
➢ Smoking Rates
➢ Poverty Rates

Justification:
➢ Primary Cancer Prevention
➢ Non-essential income
➢ Access to Care
➢ Amount of needed resources to serve population
➢ Known Disparities by Race and Ethnicity

Maps generated from CDC website Interactive Atlas of Heart Disease and Stroke https://www.cdc.gov/dhdsp/maps/atlas/index.htm for all indicators except race/ethnicity distribution.

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Methodology: Health Equity Scoring
(Breast, Cervical, and Colon Cancer)

How do/should we do this work

Data mapping from CDC Atlas website not available by health district or census tract for NE. County level maps for each indicator was generated and overlayed with local health district boundaries.

Each health district received a health equity score based on the proportion of counties' severity of the health equity indicator. Consideration was made for both geographic area and population of county.

Each health equity indicator was then sorted by severity– Bar charts used to assist in tier allocation Tiers 1-3 were assigned based on the clustering of similar indicator rates

Scoring:
Base score started with Tier level 1-3.
Scores for each Health Equity indicator tallied for a total Health Equity Score.
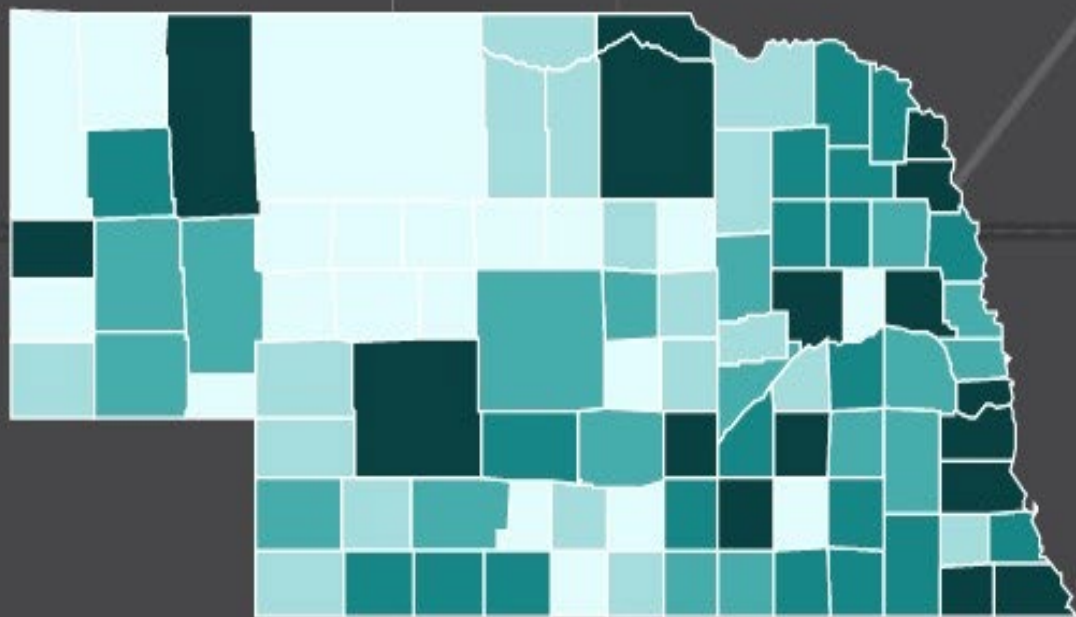
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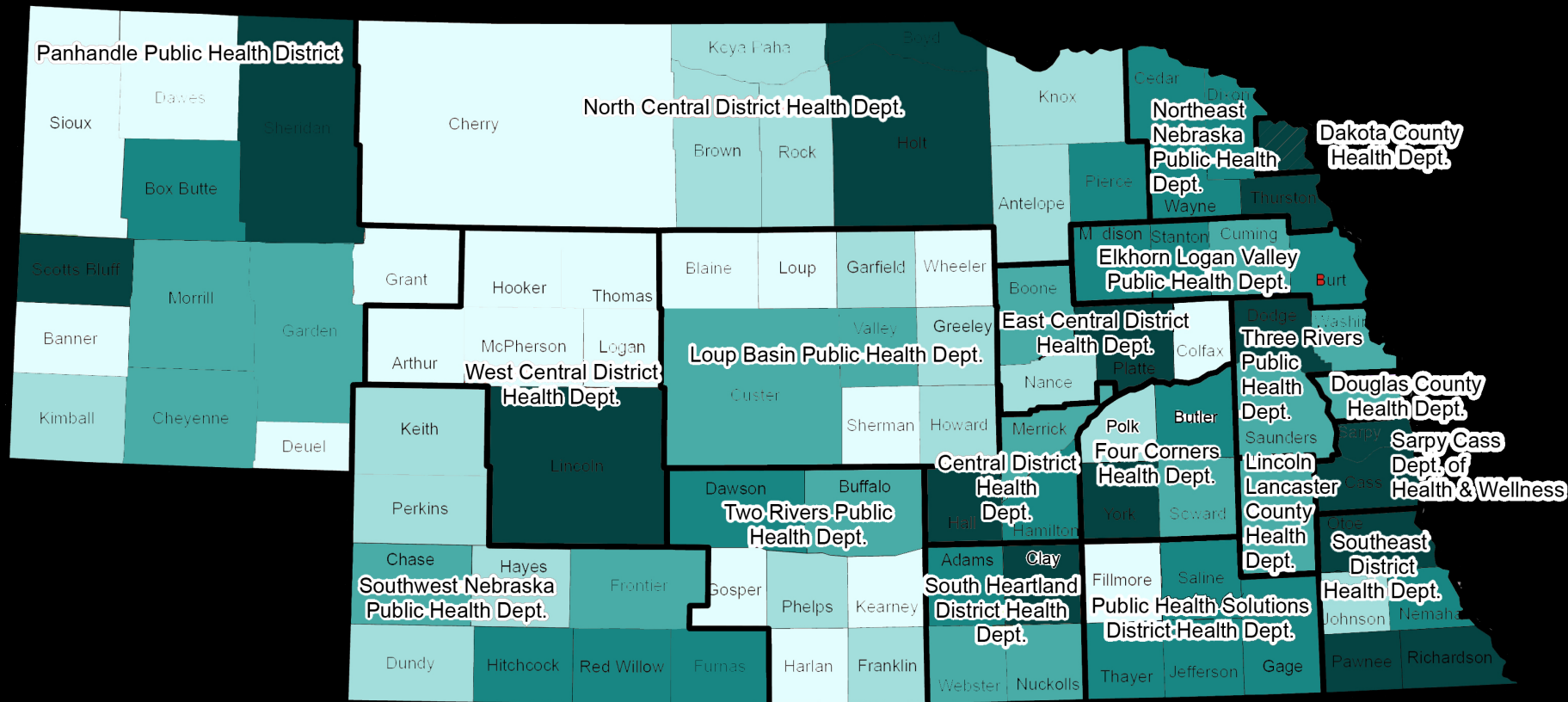
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CDC Atlas Map for Obesity

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CDC Atlas Obesity Map with LHD boundary overlay

Total Health Equity Scores by Local Health Department

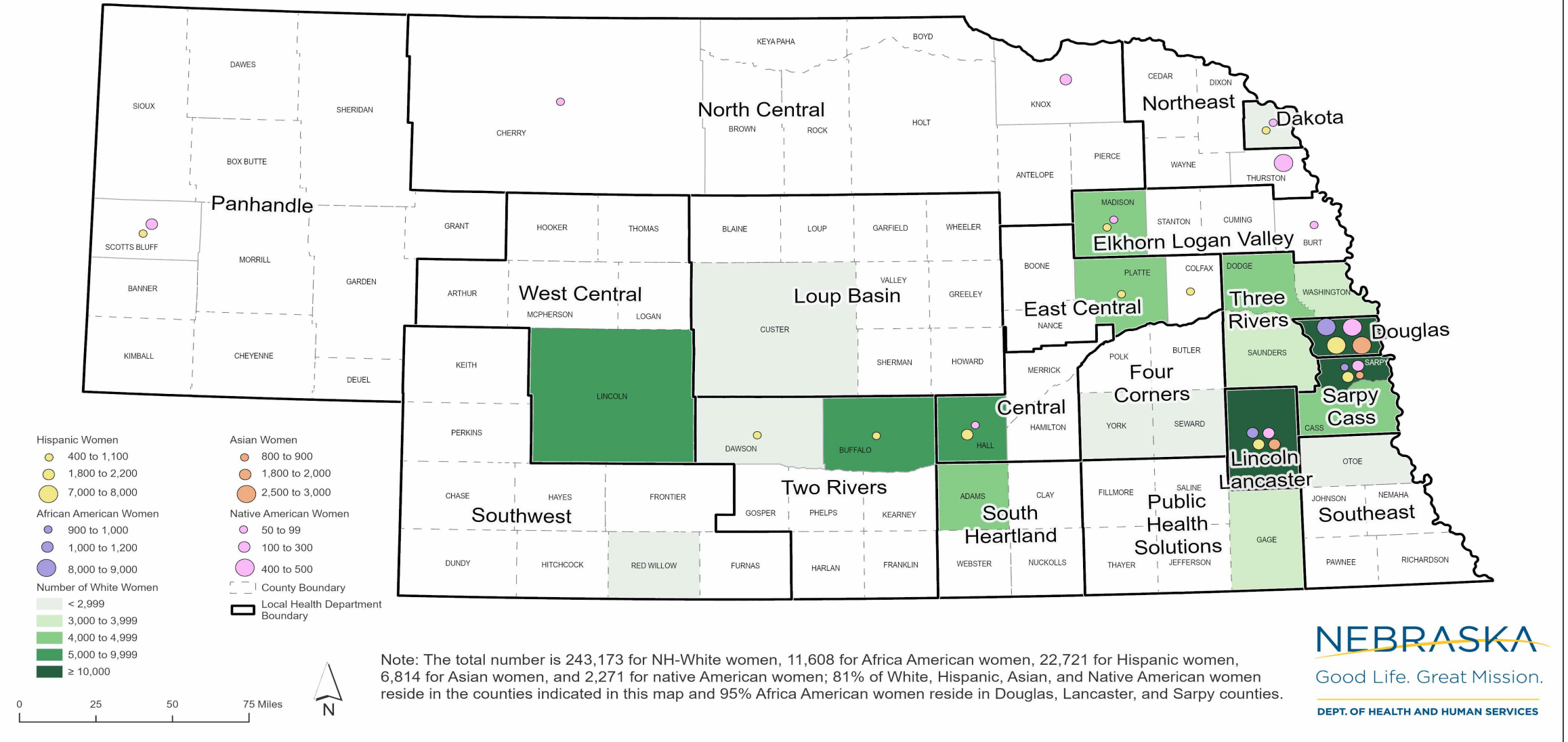|	80% of non white pop.	80% of non white pop.	Housing Cost Burden	Uninsured	Obesity rates	Physical Inactivity	Poverty rates	Smoking Rates		Total HE Score
Four Corners			2	1	3	2	2	2		13
Loup Basin			3	2	2	2	3	2		15
Southwest			2	3	2	2	3	2		15
Northeast	NA	1	2	2	3	2	2	2		16
Three Rivers			2	3	2	2	2	2		16
Public Health Solutions			3	2	3	2	2	3		17
Southeast			2	2	3	3	2	3		17
North Central	NA	1	2	3	2	3	3	2		18
South Heartland			3	2	3	3	2	2		18
Two Rivers	H	1	3	2	2	2	2	2		18
Sarpy Cass	B,H,A,NA	4	1	1	3	1	1	1		19
West Central			3	2	3	3	2	3		19
East Central	H	1	2	2	3	3	2	3		20
Dakota County	H, NA	2	2	3	3	3	2	2		22
Lancaster County	B,H,A,NA	4	3	1	2	1	2	1		22
Elkhorn Logan Valley	H,NA	2	3	2	3	3	2	3		23
Central District	H,NA	2	2	3	3	3	3	3		25
Douglas County	B,H,A,NA	4	3	2	2	2	2	2		25
Panhandle	H, NA	2	3	3	3	3	3	3		25

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Geographic Distribution by Race/Ethnicity for at Least 80% of Women Aged 40-64, 2020 Census

Note: The total number is 243,173 for NH-White women, 11,608 for Africa American women, 22,721 for Hispanic women, 6,814 for Asian women, and 2,271 for native American women; 81% of White, Hispanic, Asian, and Native American women reside in the counties indicated in this map and 95% Africa American women reside in Douglas, Lancaster, and Sarpy counties.

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Every Woman Matters Medical Provider Network
Nebraska, 2023

Note: The total number of active medical providers is 604.

The Program-Eligible Female Population Distribution for Cervical Cancer Screening, 2020 Census

Number of Uninsured Women
- 1 to 99
- 100 to 499
- 500 to 999
- 1,000 to 4,999
- 5,000 to 11,000
- County Boundary
- Local Health Department Boundary

0   25   50   75 Miles

N

Note: These women aged 21-64 with a household income 250% FPL or below and no insurance, the total number is 34,095.

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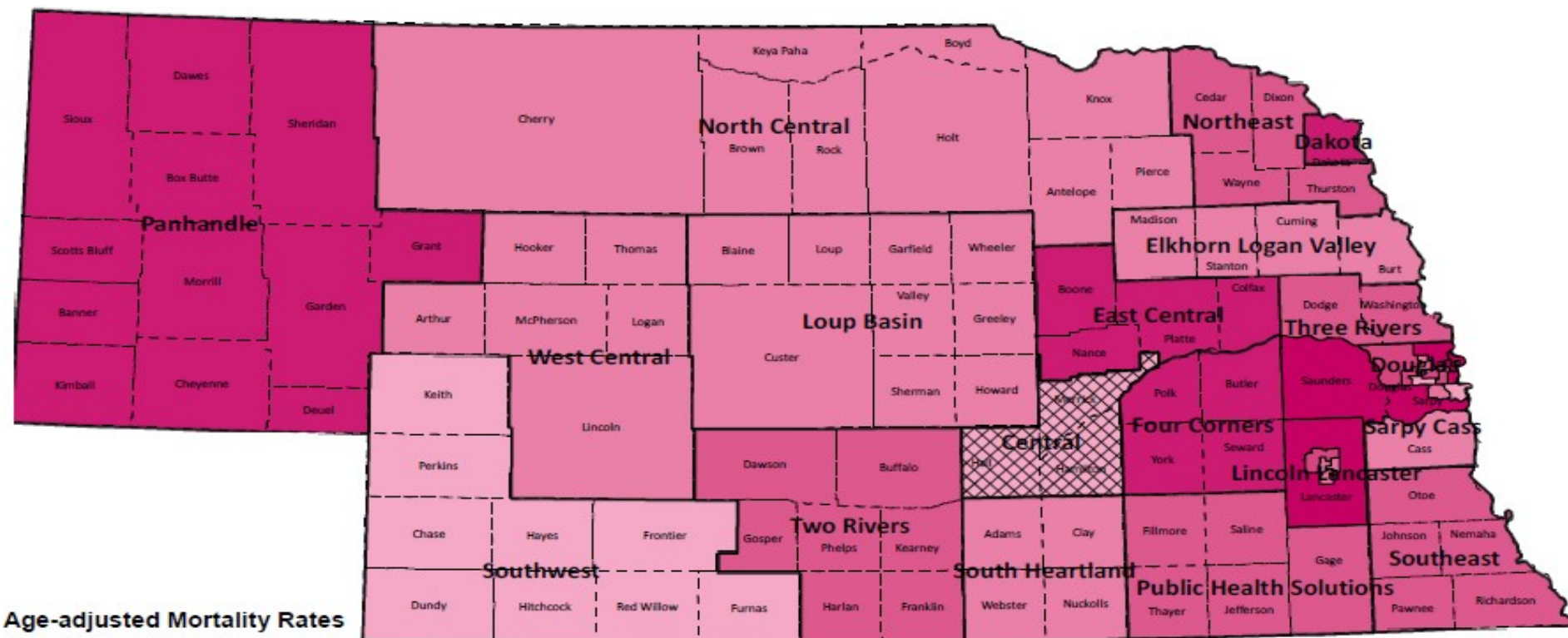DEPT. OF HEALTH AND HUMAN SERVICES

Female Breast Cancer Deaths in Nebraska, 2016-2020
Mortality Rates by Local Health Departments and Reporting Zones

Rates are expressed as the average annual number of new cases per 100,000 population and age-adjusted to the 2000 U.S. population
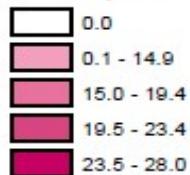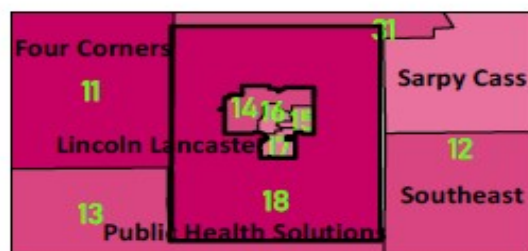

Statewide incidence rate=20.2

Age-adjusted Mortality Rates

Significantly Lower*
- ▨ 1

Mortality rate
- ☐ 0.0
- 0.1 - 14.9
- 15.0 - 19.4
- 19.5 - 23.4
- 23.5 - 28.0

Lancaster County
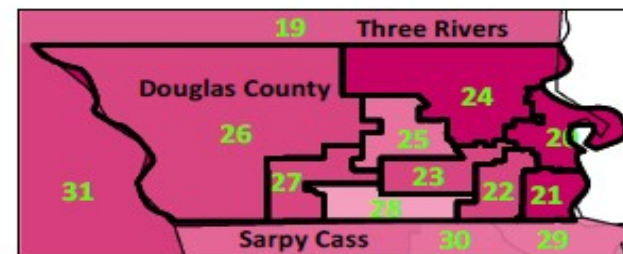
Douglas County

Note: * The mortality rate is significantly lower than state average.

Limitations/Discussion

▸ Number of eligible population per LHD/zone

▸ Racial/ethnic disparities related to disease burden

▸ Utilization of Zones for Douglas, Lancaster and Sarpy Counties

▸ Are the health equity indicators the right ones/ Others

  ▸ Such as transportation
  ▸ Broadband availability
  ▸ Food deserts-Utilization of SNAP
  ▸ Medicaid usage

▸ Weighting - Should we weight if some indicators are more important?

▸ Does incidence matter if screening rate high, mortality low and late stage disease low.

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Collaboration Thank you

Internal Leadership Team
- Jolene Rohde
- Marissa Ayotte
- Cathy Dillon
- Jaime Hahn
- Jeff Armitage
- Melissa Leypoldt
- Gwen Hurst

Data Data Data

➢ **Lifeng Li, MPH Cancer Registry**
➢ **Janping Daniels, PhD -WMHPs**

Scoring
➢ **Tina Goodwin**
➢ **Raji Timmaraju**
➢ **Cathy Dillon**

Maps
➢ **Tracey Bonneau**
➢ **Jennifer Parmeley**

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Next Steps-Further Review

▷ ***Using Social Vulnerability Index as measure for Health Equity***

   ▷ Review SVI as a tool for measuring health equity to identify areas experiencing barriers to cancer prevention, diagnosis, and treatment.

   ▷ Many measures used by the program are included in SVI or the Environmental Justice Index

   ▷ The SVI measures percentage of population under 17 and over 65. This does not identify population of women 21-64, the primary target for breast and cervical cancer screening.

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Next Steps-Further Review

▸ ***Merit of adding Disease Burden and Health Equity scores for a total score in which prioritizes funding allocation***

  ▸ Disease burden not a perfect match with areas experiencing health disparities.

  ▸ Use Disease Burden mapping to identify priority areas

  ▸ Use Health Equity mapping to identify intensity of efforts/funding/population base

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Outcome

▸ *Final maps created*

1. Breast cancer disease burden map by local health district
2. Cervical cancer disease burden map by local health district
3. Breast Cancer Health Equity map with additional indicator for population of women 40-64 with incomes =<250% Federal Poverty Level
4. Cervical Cancer Health Equity map with additional indicator for population of women 21-64 with incomes =<250% of Federal Poverty Level

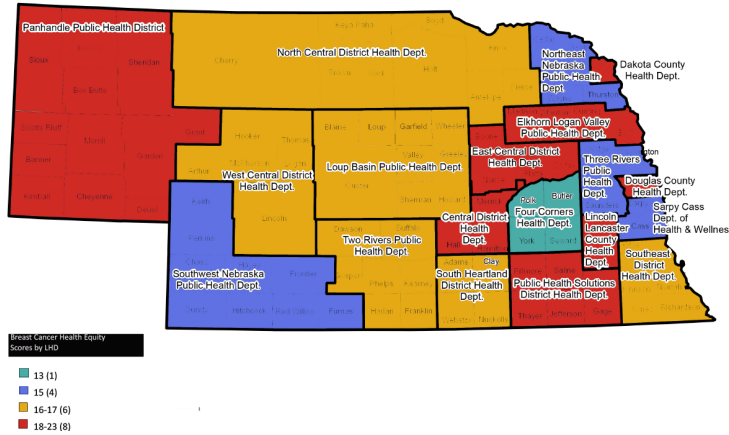5. Go back to internal partners for discussion and then post to website

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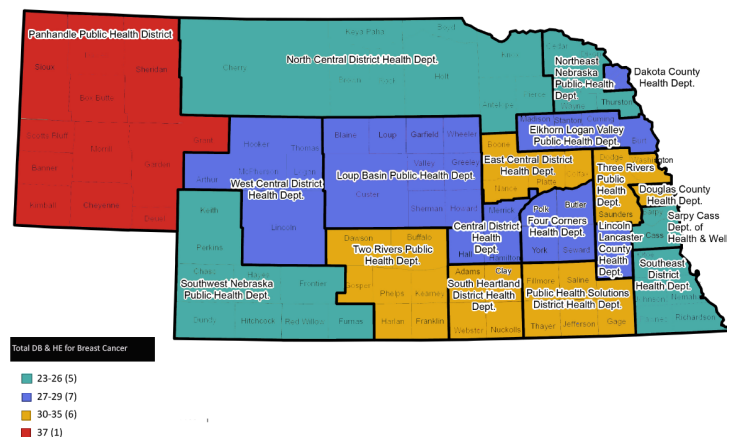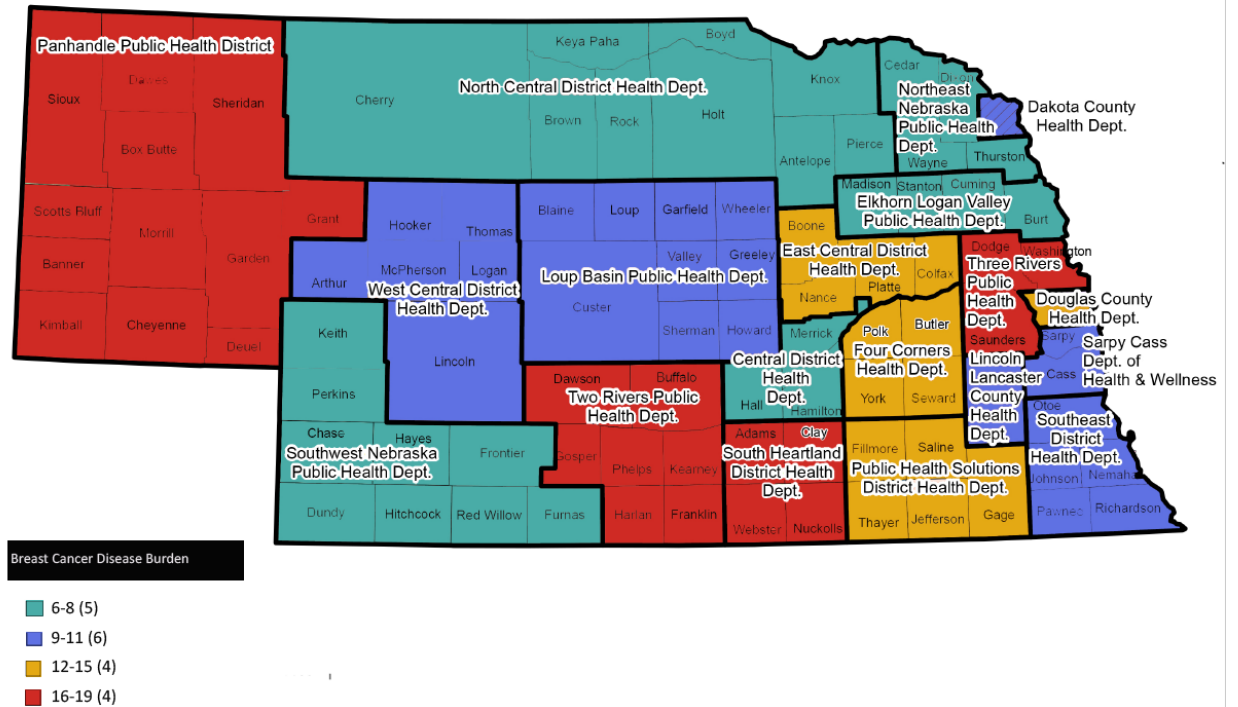DEPT. OF HEALTH AND HUMAN SERVICES

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Breast Cancer Health Equity Scores By Local Health Department

Breast Cancer Disease Burden

Total Disease Burden & Health Equity for Breast Cancer

Cervical Cancer Disease Burden

Panhandle Public Health District — Sioux, Dances, Sheridan, Box Butte, Scotts Bluff, Morrill, Garden, Banner, Kimball, Cheyenne, Deuel

North Central District Health Dept. — Keya Paha, Boyd, Knox, Cherry, Brown, Rock, Holt, Antelope, Pierce

Northeast Nebraska Public Health Dept. — Cedar, Dixon, Wayne, Thurston

Dakota County Health Dept.

Elkhorn Logan Valley Public Health Dept. — Madison, Stanton, Cuming, Boone, Burt

East Central District Health Dept. — Colfax

Three Rivers Public Health Dept. — Dodge, Washington, Saunders

Douglas County Health Dept.

Sarpy Cass Dept. of Health & Wellness — Sarpy, Cass

West Central District Health Dept. — Grant, Hooker, Thomas, Arthur, McPherson, Logan, Keith, Lincoln, Perkins

Loup Basin Public Health Dept. — Blaine, Loup, Garfield, Wheeler, Valley, Greeley, Custer, Sherman, Howard, Nance, Platte

Central District Health Dept. — Merrick, Hall, Hamilton

Polk / Four Corners Health Dept. — York, Seward

Two Rivers Public Health Dept. — Dawson, Buffalo

Southwest Nebraska Public Health Dept. — Chase, Hayes, Frontier, Gosper, Dundy, Hitchcock, Red Willow, Furnas

South Heartland District Health Dept. — Adams, Clay, Phelps, Kearney, Harlan, Franklin, Webster, Nuckolls

Public Health Solutions District Health Dept. — Fillmore, Saline, Thayer, Jefferson, Gage

Lincoln Lancaster County Health Dept.

Southeast District Health Dept. — Johnson, Nemaha, Pawnee, Richardson

Cervical Cancer Disease Burden

- 6-8 (4)
- 9-11 (6)
- 12-14 (6)

Cervical Cancer Health Equity Scores By Local Health Department

Cancer Health Equity LHD

- (1)
- (2)
- -17 (7)
- -23 (9)

Total Disease Burden & Health Equity for Cervical Cancer

Total DB & HE for Cervical Cancer

- 22-26 (6)
- 28-29 (4)
- 30-31 (5)
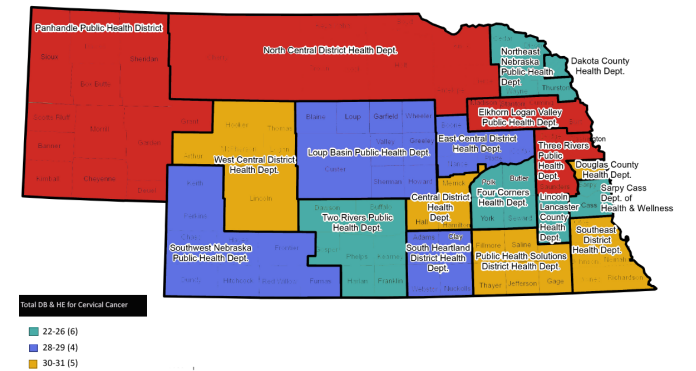
Melissa Leypoldt, RN

WMHP Program Director

Melissa.Leypoldt@nebraska.gov

@NEDHHS   NebraskaDHHS   @NEDHHS

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