



AIRA
AMERICAN IMMUNIZATION
REGISTRY ASSOCIATION

IIS Data Use

AIRA Discovery Session

June 25, 2018

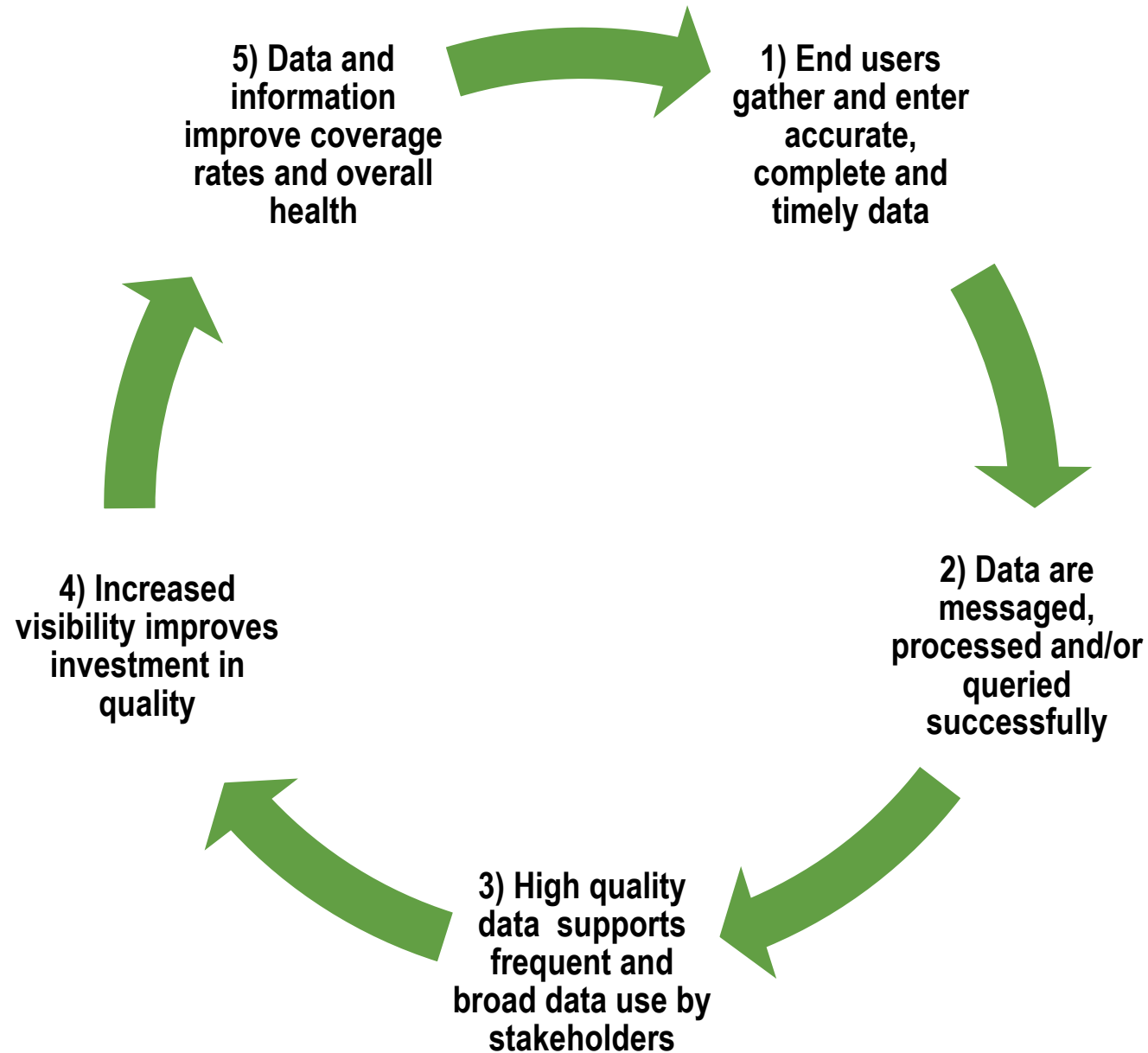
4pm Eastern

Overview

Two Presentations on Data Use

- Developing Medicaid immunization rates, and Oregon's partnerships supporting Medicaid and HEDIS data use.
- Using IIS data to generate HPV coverage rates, and future data use plans in North Dakota
- Questions, Comments and Discussion





The Data Quality/Data Use Cycle



Today's Speakers:

- Steve Robison, Oregon ALERT Immunization Information System, Oregon Immunization Program
- Dominick Fitzsimmons, North Dakota Immunization Information System, North Dakota Department of Health



Medicaid & IIS- A Brief Overview from Oregon

Steve Robison

Oregon Immunization Program



Overview

Topics for today:

- Current issues with IIS and Medicaid
- IIS superiority
- Medicaid- description
- HEDIS
- Oregon history
- Process
- Challenges
- Current status



Illustration- where does your IIS data go?

Medicaid and IIS Issues

- CMS: The U.S. Centers for Medicare & Medicaid Services.
- State Medicaid programs submit core quality measure to CMS, including immunization rates.
- CMS is currently publishing state-level scorecards including immunization rates.
- Recently CMS staff have been asking how to use IIS data across states for Medicaid and CHIP rates.

IIS Data Superiority

- Question from CMS: Are IIS data more complete than Medicaid claims data for their clients?
- Current studies support IIS superiority against:
 - clinic datasets & healthplan data
- Lack of evidence(?) about IIS superiority against:
 - All-payor datasets & Medicaid data



Local(Oregon) IIS versus Medicaid Data

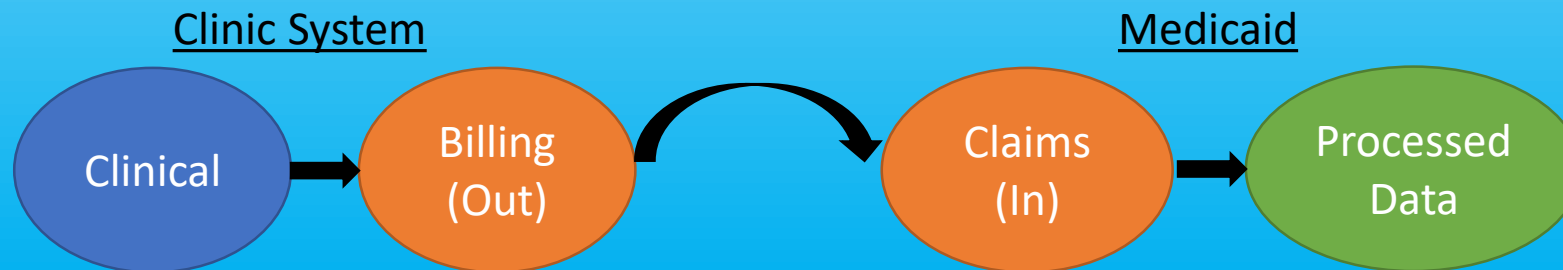
A number of Immunization Programs may have informal findings about the superiority of IIS versus Medicaid data.

In Oregon, two (unpublished) studies:

- 1) For two year olds, 5% of Medicaid clients had immunizations in the IIS that weren't in Medicaid claims (2012)
- 2) For adolescents, for immunizations from age 9 onward, ~30% of Medicaid clients had non-Medicaid reported immunizations.

Medicaid Data- Overview

- Medicaid data systems follow CMS standards, but great variability across states.
- Medicaid immunization data is claim based.
- Health insurance claims data is typically two+ steps removed from clinical data:



Medicaid Immunization Assessment

- CMS relies on HEDIS quality assessment measures
- HEDIS is a bundle of measures, developed and maintained by the National Committee for Quality Assurance (NCQA)
- NCQA/HEDIS immunization measures predate most IIS.
- Standards based on claims reporting
- Depends on assessment in a continuously enrolled population
- Assessments by 2nd birthday and 13th birthday

Oregon History

- Oregon was a pioneer in using the ALERT IIS to support our Medicaid program.
- Starting in 2008, Oregon Medicaid began sending client lists to OIP for rate assessment.
- Oregon Medicaid proposed the use of IIS as a national standard to CMS in 2011(denied)



Oregon Medicaid-ALERT IIS Process

Oregon Medicaid Program:

- Extract client lists meeting enrollment criteria per HEDIS
- Transfers client list to ALERT IIS staff

ALERT IIS Staff:

- Merge Medicaid client list to ALERT clients
- Lookup immunizations for merged clients

Assessment:

- 2008 to 2011: ALERT IIS calculated UTD rates
- 2012 to 2014: returned client lists with imm counts to Medicaid
- 2014 onward: returned immunization records to Medicaid

Medicaid to ALERT IIS Challenges

There are a number of major challenges in using IIS data with Medicaid clients

- Merging clients-
 - Medicaid/IIS similarity of issue with clients having multiple records.
 - Misentry of basic demographics/name/dob in Medicaid can impede merge.
- Immunization counting-
 - HEDIS is dose counting by target birthday, with no grace periods
 - ALERT IIS (WIR system) automatically cleans close-spaced shots

Current Issues/Concerns

- Issue of whether Medicaid staff, coming out of a claims/CPT background, understand immunizations.
- Potential incompleteness of HEDIS specifications for CVX codes.
- Medicaid program use of immunizations in composite measures/reporting outside of IIS review.
- ‘Gap’ populations left behind by continuous enrollment requirement.
- Applicability of Oregon lessons to other states- are IIS ready to take over from claims reporting?

Questions?

& how does your program
interact with Medicaid?

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Geographic distribution of HPV Vaccination Coverage among Adolescents in North Dakota

NORTH DAKOTA IMMUNIZATION INFORMATION
SYSTEM (NDIIS)

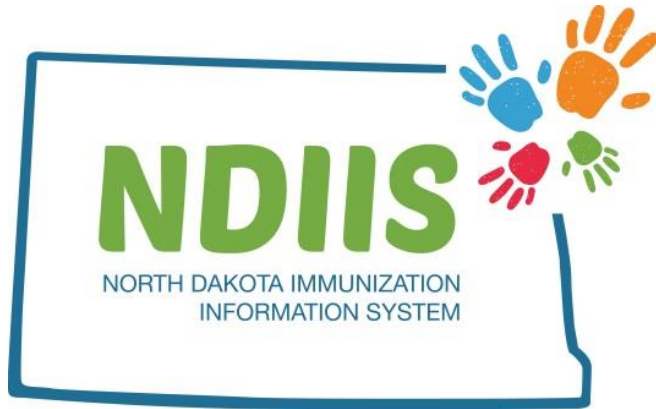
DOMINICK FITZSIMMONS, NDIIS COORDINATOR



NORTH DAKOTA
DEPARTMENT *of* HEALTH

Background

The NDIIS



- The North Dakota Immunization Information System (NDIIS) is a population-based system that attempts to collect demographic and vaccine dose information on all North Dakotans, active since 1996.
- Immunizations administered to anyone 19 years of age and younger are mandated for reporting to the NDIIS *.
 - The majority of healthcare providers are reporting immunization data electronically.
- Adolescent participation is high, with 89% of adolescents ages 11-17 years olds having at least two immunization record in the NDIIS.
- The NDIIS is one of six Centers for Disease Control and Prevention (CDC) Sentinel Site awardees.

○ *North Dakota Century Code 23-01-05.3, Immunization Data*

Sentinel Site Project

- North Dakota is one of six CDC Sentinel Sites, selected to receive additional grant funding because the NDIIS has consistently met the following three criteria:
 - At least 85% of vaccine provider sites enrolled in the IIS
 - At least 85% of the children less than 19 years of age are participating in the IIS
 - At least 70% of the doses administered from the sentinel site area should be submitted to and processed by the IIS within 30 days of administration
- As a Sentinel Site, the NDIIS is required to complete evaluation activities each year.

Purpose

- In 2017, the NDIIS completed an evaluation activity to assess the geographic distribution of Human Papillomavirus (HPV) vaccination rates among adolescents:
 - at the statewide level
 - in urban and rural areas
 - in oil-producing counties
 - and within American Indian (AI) reservation land boundaries
- A concurrent purpose of this study was to be able to compare NDIIS-based HPV coverage to published NIS-Teen coverage estimates.
 - HPV coverage was replicated using published NIS-Teen methodology.



Demographics-Urban vs. Rural

- Metropolitan and Micropolitan Statistical Areas are defined by the US Office of Management and Budget as:
 - *“a core area containing a substantial population with adjacent communities having a high degree of economic and social integration with that core”.*
 - Metropolitan Statistical Areas (MtSAs) have at least one urbanized area with a population of at least 50,000 people. Micropolitan Statistical Areas (MiSAs) have at least 10,000 but < 50,000 population.
- Four ND counties are considered MtSAs
- Eight ND counties are considered MiSAs
 - 6 of which are oil-producing
- 73.1% of the state's population lives in an MtSA/MiSA county in North Dakota.
 - 45.0% of the population live in the three counties containing MtSA central cities (Bismarck, Fargo, Grand Forks)
 - All MtSA central cities are located in the central-to eastern half of the state

NIS Teen vs NDIIS

- Due to the small sample size for North Dakota in the NIS-Teen, NIS disparities data is unavailable by race/ethnicity and incompletely available by geography.
 - In the 2015 NIS-Teen, a range of 33 to 159 individuals was sampled for HPV coverage estimations in North Dakota.
 - Coverage estimates based on very small numbers may not reflect the population coverage accurately.
 - Confidence intervals for this data tend to vary widely and are potentially unreliable.
- In contrast, HPV coverage rates calculated from NDIIS data are population-based
 - This can be considered a more robust source of data for immunization coverage analysis

NIS Teen- Indications of Disparity

- According to published NIS-Teen 2015 data estimates:
 - National coverage for HPV vaccine is higher among female adolescents living below the poverty level ($44.4 \pm 3.9 \%$), versus those living at or above the poverty level ($41.3 \pm 2.1 \%$).
 - In North Dakota, 11.2% of all persons are estimated to live in poverty.
 - Among AI individuals, the poverty rate is much higher
 - 37.5% are living below the poverty line in North Dakota.
- NIS-Teen data also indicated higher HPV vaccination coverage among females living in MtSA Central Cities versus those living in less urbanized areas.
- NIS-Teen data was not calculated for AI adolescents in North Dakota , and is not calculated for most states.
- However, national adolescent AI HPV coverage estimates tend to compare closely to overall rates.
 - National data from 2015 shows $38.7 \pm 12.9 \%$ coverage among female AI adolescents versus $39.6 \pm 2.1\%$ among female white adolescents.

Demographics-Population Change

- North Dakota is a predominantly rural state, with an average pop density of 9.7 people per square mile.
- Out of the state's 53 counties, 17 are considered oil-producing by the Department of Mineral Resources.*
 - Experiencing high rate of growth and movement of people, including adolescents and young adults in the last decade
- US Census data indicates that much of the greatest population growth has occurred in oil producing counties (*Figure 2, Table 1*)
 - Some counties experienced 30-100% increases in population from 2010-2015..

*<https://www.dmr.nd.gov/oilgas/stats/statisticsvw.asp>

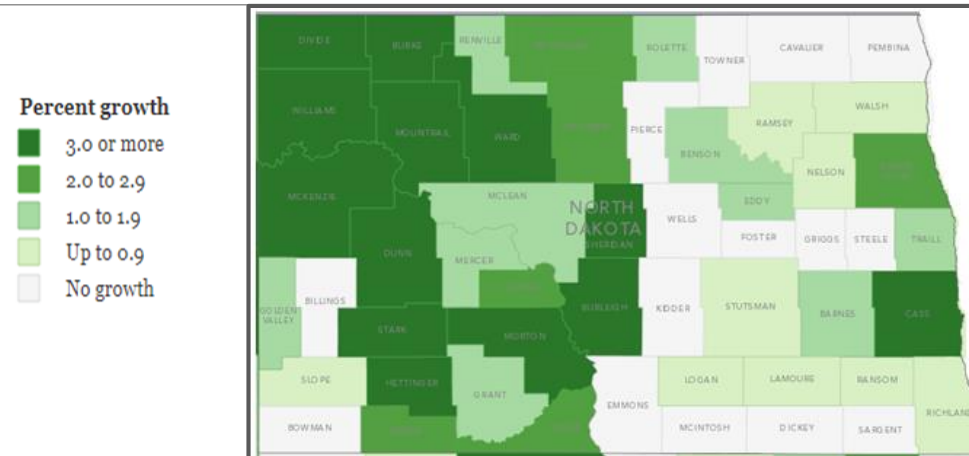


Fig 2: US Census county population growth, years 2012-2013

Oil Producing County	Population 2010 (Census)	Population Estimate (as of July 1) 2015	Projected Population Change (%)
McKenzie	6360	12792	<u>101.1</u>
Williams	22398	35387	<u>58</u>
Mountrail	7673	10307	<u>34.3</u>
Stark	24199	32139	<u>32.8</u>
Dunn	3536	4574	<u>29.4</u>

Table 1: Oil-producing county projected population changes, 2010 to 2015 (top five)

Demographics-Migration

- North Dakota's oil-producing counties have experienced significant migration in the last decade.
- The primary source of recent population change in these counties has been due to the changes in oilfield related employment (*Figure 3*).
- An east-west divide in the state is readily apparent in the population change map for 2012-2013*.

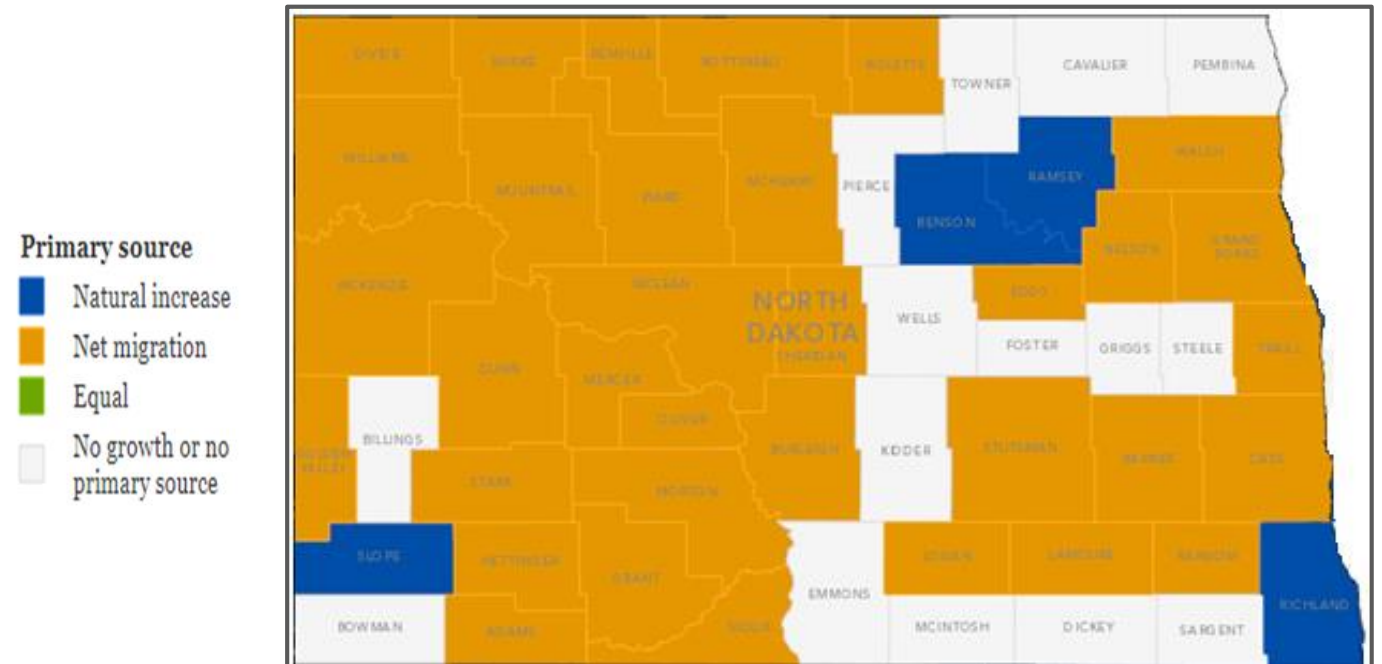


Fig 3: US Census 2012-2013 primary source of population change in North Dakota by county

*<http://storymaps.esri.com/stories/2014/census-county-population-change/>

Demographics-American Indian

- North Dakota has four American Indian (AI) reservations within its borders, which are all located in rural counties.
- The state has one of the highest proportions of AI residents in the United States.
 - US Census estimate, 2016: 5.5%
- Within the NDHS, 5.1% of all active records belong to AI individuals.
 - Studies have shown that HPV vaccine uptake among AI individuals is low in general.
 - AI women living in the northern plains are twice as likely as the national average to report HPV infection.*

**HPV Vaccine Uptake Low Among Native Americans, Fed Pract. 2016 April;33(4): e2*

Geographic Immunization Disparity

- The North Dakota Department of Health has begun assessing immunization coverage rates at the county level for all routinely recommended vaccines among all age groups, including adolescents (*Figure 4*).
 - An east-west geographic disparity in immunization coverage has become apparent.
- Western, predominantly oil-producing counties have lower immunization rates overall.
 - Adolescent immunization series rates are lower in areas that overlap counties with higher population change and migration rates.

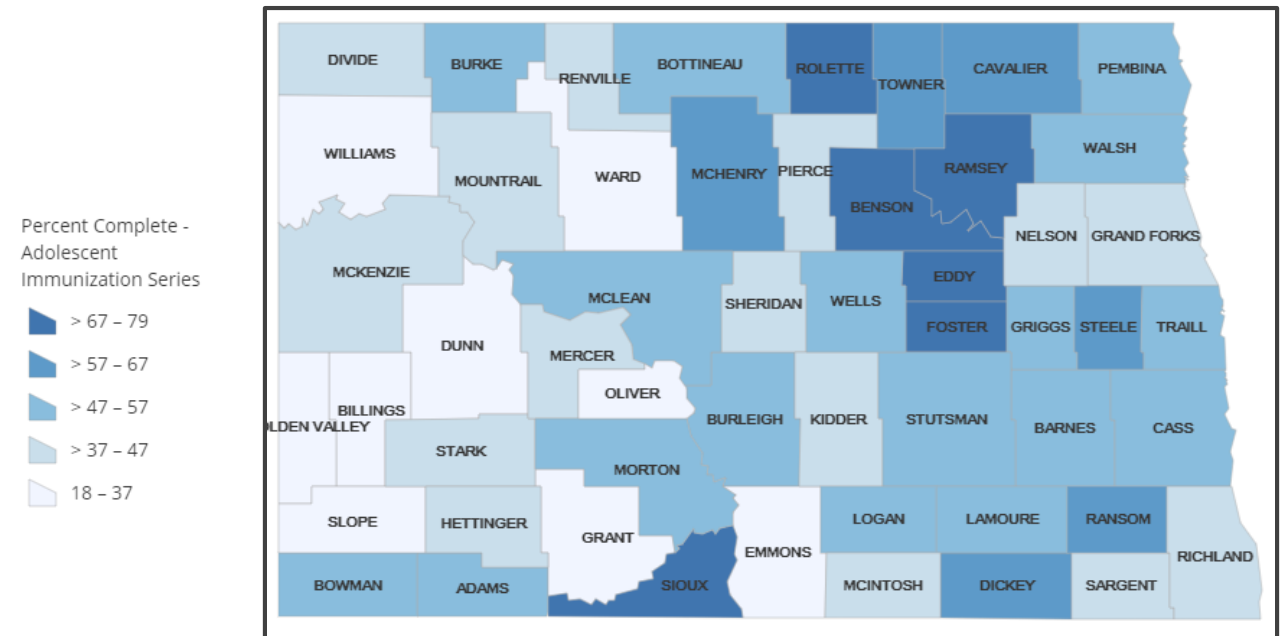


Fig 4: 1:1:2 Adolescent immunization series completion rates by county, 13-17 year olds, quarter 1 2018.

(1:1:2 adolescent vaccine series includes ≥ 1 dose of Td or Tdap vaccine, ≥ 1 dose of meningococcal conjugate (MCV4) vaccine and up-to-date with either 2 or 3 doses of human papillomavirus (HPV) vaccine)

Current HPV Coverage Rates

- Mapping NDIIS data for up-to-date HPV coverage among all adolescents 13-17 years of age by county reveals geographical patterns of distribution (*Figure 1*):
 - Generally lower coverage rates in western counties
 - high coverage overlapping three AI reservations boundaries (Sioux, Rolette, Ramsey Counties)
 - coverage in predominantly urbanized counties close to statewide rate of 51.2% for females and 45.4% for males
 - average rate in MtSAs is 46.2%
 - average rate in MiSAs is 43.5%
 - for males and females

Percent Complete -
HPV Up-to-Date

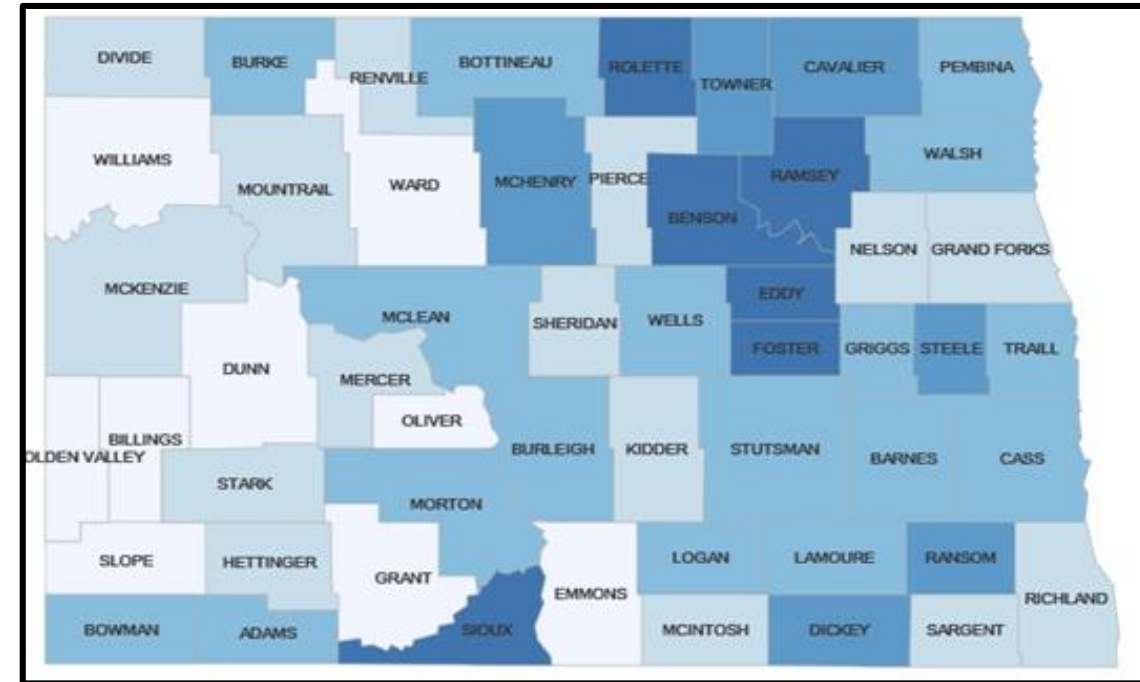


Fig 1: HPV Up-to-Date Coverage by County, Female and Male Adolescents, Quarter 1, 2018

Methods

HPV Vaccine Coverage

○ Replication of NIS-Teen Methodology

- Comparing published NIS-Teen data from 2008 through 2015 to NDIIS Data, for male and female adolescents age 13-17 years.
 - NDIIS 3-dose HPV coverage data was calculated among matching birthdate cohorts for each year of NIS-Teen publication
 - For active, non-moved or gone-elsewhere records
 - For valid HPV doses (HPV-2 (Cervarix®), HPV-4 (Gardasil®), HPV-9 (Gardasil-9®), HPV (unspecified))
- Data was stratified using NDIIS client record demographic information.*
 - by county
 - by zip code

○ Assessing Urban and Rural Areas Coverage

- MtSA and MiSA overlapping county borders were also considered, to assess the urban versus rural divide.

○ Assessing AI Reservation Areas Coverage

- Zip code areas were used to approximate AI reservation boundaries.
 - Intersecting and overlapping zip codes were considered as reservation areas and included in coverage calculations.

**According to the NDDoH small numbers release policy, only areas analyzed with >5 adolescents in the population denominator were included.*

Coverage Visualization

- Three-dose HPV coverage by gender was mapped by county and by zip code using ArcGIS Online®.
 - Additional layer data for AI reservation boundaries and MtSA/MiSA areas were added from online Esri® map layers.
- As some zip codes and counties overlap reservation areas, coverage rates for individuals living within AI reservation boundaries were manually estimated
 - based on the overlying and intersecting zip code areas
- Urban areas were assessed as counties lying with MtSAs and MiSAs.
 - NIS-Teen does not specifically publish data on these areas, rather by MtSA central city (of which ND has three) and by Outside MtSA/MiSA (rural counties in ND).

Results

NIS-Teen Data vs. NDIIS Data

- Comparing published NIS-Teen HPV coverage estimates on adolescents ages 13-17 years at the state level(*Table 2*):
 - NDIIS coverage has been quite close to NIS-Teen estimates for most published years.
- For most NIS-Teen published years, NDIIS HPV Coverage rates have fallen within NIS-Teen estimate confidence intervals.

	HPV ≥ 3 Dose Coverage (%)					
<u>Year</u>	<u>NIS-Teen Female</u>	<u>NDIIS Female</u>	<u>% Difference Female</u>	<u>NIS-Teen Male</u>	<u>NDIIS Male</u>	<u>% Difference Male</u>
2015	47.1 (±9.1)	40.7**	6.4	38.4 (±8.6)	28.9	9.5
2014	41.7(±9.4)	36.2**	5.5	25.3(±7.8)	21.9**	3.4
2013	41.1(±9.1)	31.7	9.4	18.4(±7.5)	13.9**	4.5
2012	40.9(±9.6)	27.1	13.8			
2011	27.8(±10.3)	23.7**	4.1			
2010	26.3 (19.8-34.0)	20.3**	6			
2009	31.7 (23.6-41.1)	16.7	15			
2008	15.9 (10.8-22.8)	11.7**	4.2			
2007						
2006						

Table 2: NIS-Teen HPV vaccination coverage estimates compared to NDIIS HPV vaccination coverage rates by year and gender for adolescents ages 13-17 years

County Level Coverage

- NDIIS based HPV coverage rates in 2015 among female adolescents are higher overall compared to males (*Figure 6*).
- There is an indication of higher general coverage rates in eastern and central counties for females.
 - Western, south-western and southcentral counties show a tendency towards lower coverage rates.
- Standing Rock reservation is an island of high coverage on the southern-central border
 - Along with Ramsey and Rolette counties, which both contain reservation areas.

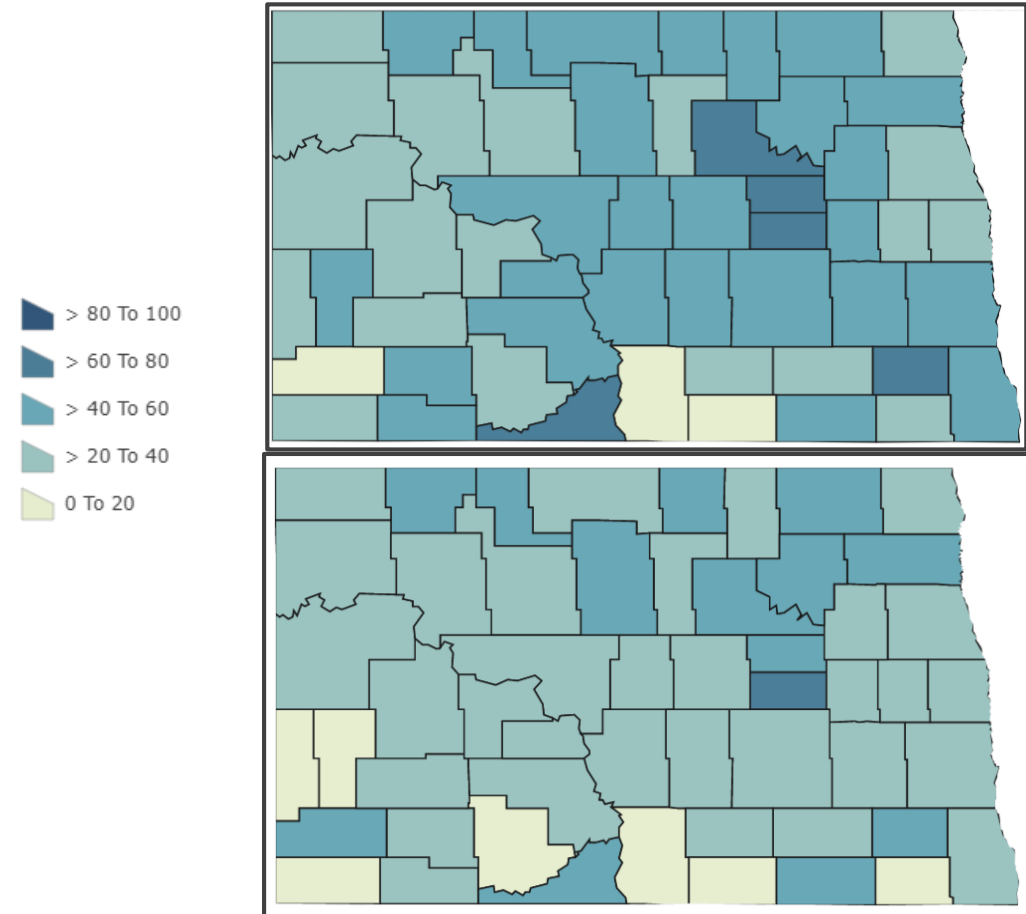


Fig 6: 2015 Female(top) and male (bottom) HPV 3-dose coverage rates by county., 2015

Urban vs Rural

- North Dakota's MtSAs and MiSAs did not show significant variance from the statewide HPV coverage rates (*Figure 7*).
 - This includes MtSA counties that contain the MSA Central Cities (Burleigh, Cass, Grand Forks).
- MtSA/MiSA counties had similar rates to bordering and surrounding counties for both males and females.
 - No clear urban/rural disparity was evident at the county level.

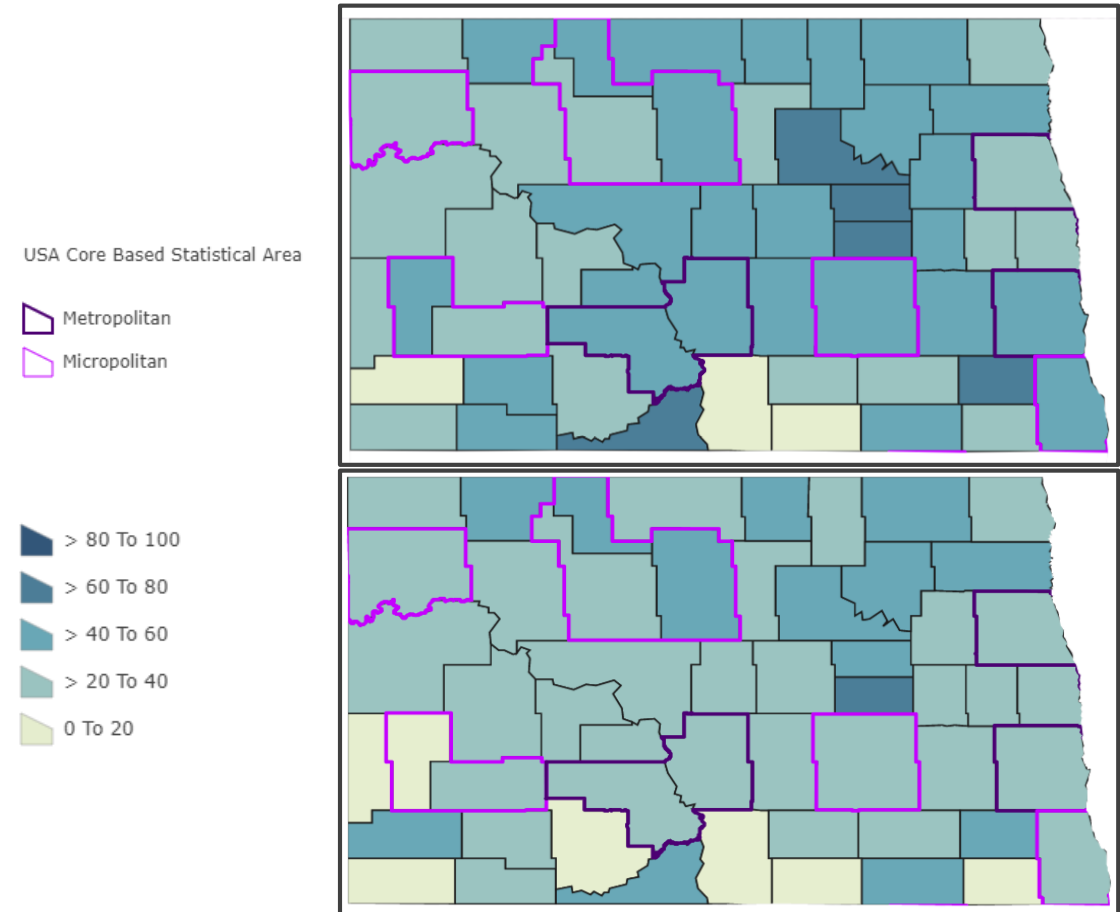


Fig 7: 2015 Female (top) and male (bottom) HPV three dose coverage rates by county and MSA, 2015

Zip Code Level Coverage

- Zip code level analysis revealed areas within counties that have higher and lower coverage than the county-level data showed (*Figure 8*).
- AI reservation boundaries (black) surround some of the state's zip code areas with the highest coverage rates.
 - Standing Rock, Spirit Lake and Turtle Mountain reservation boundaries show HPV coverage rates for females 19.7-22.2% higher than the statewide rate, and for males, rates are 20.8-24.5% higher than the statewide rate.

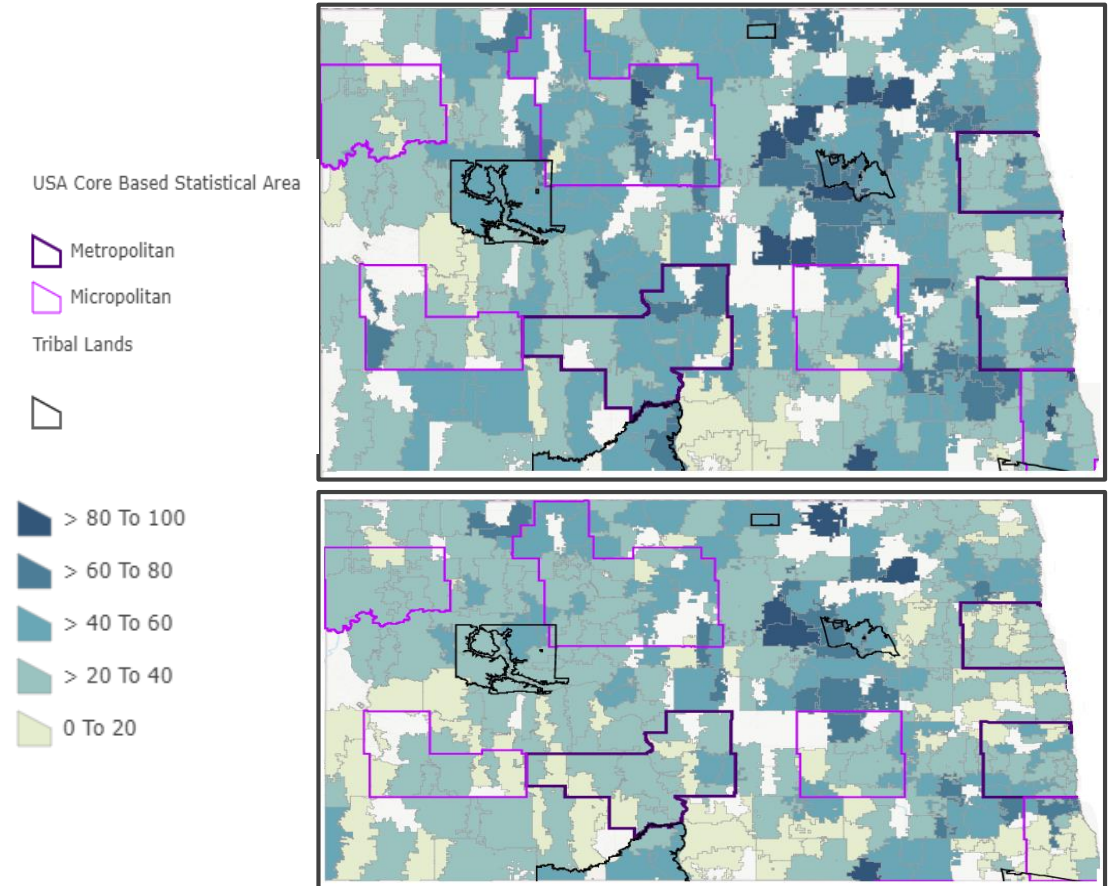


Fig 8: 2015 Female (top) and male (bottom) HPV three dose coverage rates by county, MSA and AI reservation lands, 2015

Geographic Comparison

- Comparing statewide rates, all county averages, MtSA, MiSA and non-MSA areas (*Table 3*):
 - shows no major variance in these categories.
- Comparing the AI reservation areas analyzed in this study with all other areas:
 - significantly higher HPV coverage on 3 of the 4 AI reservations was found.

<u>Geographic Location</u>	<u>Female Adolescent 3-dose Coverage (%)</u>	<u>Male Adolescent 3-Dose Coverage (%)</u>
North Dakota (statewide rate)	40.7	28.9
All Counties Average	42.8	32.0
Fort Berthold [¶]	44.3	35.3
Standing Rock [¶]	62.9	50.0
Spirit Lake [¶]	60.4	49.7
Turtle Mountain*	62.9	53.4
MtSA	41.3	27.3
MiSA	41.2	27.3
Non-MSA	43.3	33.4

Table 3: Average 3-dose HPV series completion calculated from NDIIS data for statewide, AI reservation area, MSA and non MSA counties for 2015.

Geographic Comparison-2015 vs 2014

- Comparing 2015 to 2014 data (*Table 4*):
 - Upward trend in immunization coverage across almost all areas analyzed among males and females (highlighted yellow).
 - AI reservations still stood out as islands of particularly high coverage (highlighted blue).
 - No major deviation from the statewide rate was noted for urban versus rural areas.

Location	Female 3-dose Completion (2015)	Female 3-dose Completion (2014)	Female 3-dose Completion (% Change)	Male 3-Dose Completion (2015)	Male 3-Dose Completion (2014)	Male 3-Dose Completion (% Change)
North Dakota	40.7	36.2	4.5	28.9	21.9	7.0
All Counties Average	42.8	37.7	5.1	32.0	23	9.0
Fort Berthold¶	44.3	32.3	12.0	35.3	26.7	8.6
Standing Rock¶	62.9	62	0.9	50	45.3	4.7
Spirit Lake¶	60.4	56	4.4	49.7	35.3	14.4
Turtle Mountain¶	62.9	65.4	-2.5	53.4	42.5	10.9
MtSA	41.3	37.6	3.7	27.3	20.4	6.9
MiSA	41.2	34.9	6.3	27.3	21.6	5.7
Non-MSA	43.3	38.3	5.0	33.4	23.5	9.9

Table 4: Comparison of three-dose HPV series completion rates according to NDIIS and percentage change by gender by year, 2014 2015, for statewide, reservation area, MSA and non-MSA counties.

Discussion

- As county-level data is not published by the NIS-Teen, the results of this evaluation were very informative of the HPV vaccine coverage landscape in North Dakota.
 - Comparing NIS-Teen estimates to NDHS rates shows significant similarity and agreement between the published statewide and urban estimations.
- The east-west divide in coverage is evident at each level analyzed in this study for HPV coverage among adolescents.
 - Data for males and females in 2015 showed single digit rates in some counties and yet close to 80% coverage in others.
 - In contrast to Sioux County, a neighboring county to the east, Emmons County, showed a coverage rate 53.3% lower for female adolescents, and 50.1% lower for males.
 - This disparity has been noted for other vaccines, and other age groups in North Dakota.

Discussion

- Out of the state's four AI reservation areas, three were found to have exceptionally high HPV coverage rates.
 - Rates ranged from 19-30% higher when compared to all other large geographic areas analyzed in this study.
 - Similarly, both male and female adolescent HPV coverage rates on these three reservations are higher as compared to the statewide rates.
- The use of zip code data overall shows a more nuanced picture of potential areas of need, which can be useful in more focused identification of populations or areas of lower access to healthcare resources in the state.

Limitations

- Address information is not captured historically within the NDIIS, and is dependent on provider data entry.
 - This study looked at HPV vaccine doses administered in past years but address information extracted for the mapping analysis is based on current address data, which may differ from where the individuals lived at the time they received their vaccinations.
- Another limitation of coverage based on the geographical areas of AI reservations is that some reservations are covered within a single zip code area, while others contain a significant number of zip codes that overlap with areas outside reservation boundaries.
 - Coverage rates can more certainly be said to reflect the immunization rate within the boundaries of the AI reservations that are located within a single zip code versus multiple zip codes.

Conclusion

- Overall, this study showed that the NDIIS is a useful tool to:
 - compare NIS-Teen based HPV coverage estimates to NDIIS-derived data
 - produce coverage information among populations not assessed by NIS-Teen
 - identify variable distribution of HPV immunization coverage within North Dakota's adolescent population
 - highlight potential areas of demographic and geographic immunization disparity
- Future work may include efforts to further analyze and assess the disparities and differences in immunization coverage found by this study.

Acknowledgements

Thank you to:

Mary Woinarowicz, MA, NDIIS Manager

Molly Howell, MPH, Immunization Program Manager

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Questions, Comments, Discussion?



Thanks so much!

