Maximizing System Data to Identify Children with Complexity

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Agenda for Presentation

Context Setting: Key Components of Our Efforts and Why OPIP and OHA Were Invested in This Collaborative Work

Review Specific System-level Data Being Used to Operationalize:

Part 1: **Pediatric Medical Complexity Algorithm**

Part 2: Indicators of **Social Complexity**

Part 3: **Medical** + **Social** Complexity = **Health Complexity**

Sharing the Data with Coordinated Care Organizations (CCO's) and Tracks of Support to CCOs to Use The Data

Efforts that Led Up to OPIP's Proposal

- OPIP efforts with practices and health systems focused on:
  - Identifying children and youth with special health care needs
  - Care Coordination, methods for tiering patients
  - Complex Care Management Pilot within Kaiser Permanente Northwest (KPNW)
- Through these efforts, identified barriers in:
  - Staffing and resources to serve these children
  - Community-level resources
  - Payment
  - Metrics focused on this population
- Stakeholder Engagement on the Need and Opportunity for System-Level Methods to Identify Children with **Health** Complexity
  - OPIP Partners Meetings (Public and Private Stakeholders): Fall 2015, Spring 2016
  - August 11th 2016- Meeting of Leaders within OHA, State Departments that Address Social Complexity, CCOs and Health Care Providers

OPIP

Problem…….or Opportunity!

- Despite wonderful gains in patient centered primary care homes, coordinated care organizations, and other efforts related to complex care management, there is a **need to better support children with health complexity**.
  - In order to impact children's future health & preventable chronic conditions, we need to address predictive social determinants of health and build resilience
  - In order to address children with health complexity a population and community-based approach and cross-sector engagement is required.
- One component of this effort needs to include a system-level focus.
  - At a system-level, in prioritize, invest and measure care for children with health complexity, you need to be able to identify them
  - To do this, you need:
    - Methods that are valid, reliable and meaningful
    - **Standardized and feasible** using **data available at the system-level**
    - Include data that takes into account

      Medical Complexity AND

      \+ **Social** Complexity

      Health Complexity

OPIP

OHA's Perspective: We've Got Work To Do

- Children and families still face significant obstacles to health and well-being
- Health disparities persist for many in Oregon
- Early life experiences, such as Adverse Childhood Events, can impact lifelong health
- Need to prioritize the value in intervening early and building resiliency

Oregon Health Authority

CCO 2.0 Focus Areas

CCO 2.0 policies build on Oregon's strong foundation of health care innovation and tackle our biggest health problems.

Improve the behavioral health system and address barriers to the integration of care

Increase value and pay for performance

Focus on the social determinants of health and health equity

Maintain sustainable cost growth and ensure financial transparency

Oregon Health Authority

Power of Data

- Strength of robust claims data across types of services, service lines, and CCOs enrolled
- Centralized staffing to analyze data
  - Value in centralized learning curve
  - Value in facilitation of across agency agreements about how data can be shared
    - May be cumbersome for this to be done within silos or for specific groups
- Value in more robust data to understand state level population needs, regional needs
  - Understand better child health needs based on data available
  - Informing shared conversations across departments
- Identify federal, state, local and private partners that are leads or influence the area/determinate
  - Identify related performance measures or quantified objectives
- Consider how this information can possibly be used to enhance Medicaid Value Based Payments for addressing Social Determinants of Health

OPIP Funded Proposal from Lucile Packard Foundation for Children's Health

- **Title: System-Level Approaches to Identify Children with Health Complexity and Develop Models for Complex Care Management**
- Goal: Inform health systems on novel and generalizable approaches **to identify children with health complexity,** use of this inform to design better support systems for children and their families
- **Time Period: August 2017-March 2019**
- **Key Partners:**
  - **Oregon Health Authority (OHA Health Analytics)**
  - **Coordinated Care Organizations**
  - **Kaiser Permanente Northwest – Publicly & Privately insured**

OPIP

Measuring Children's Health Complexity

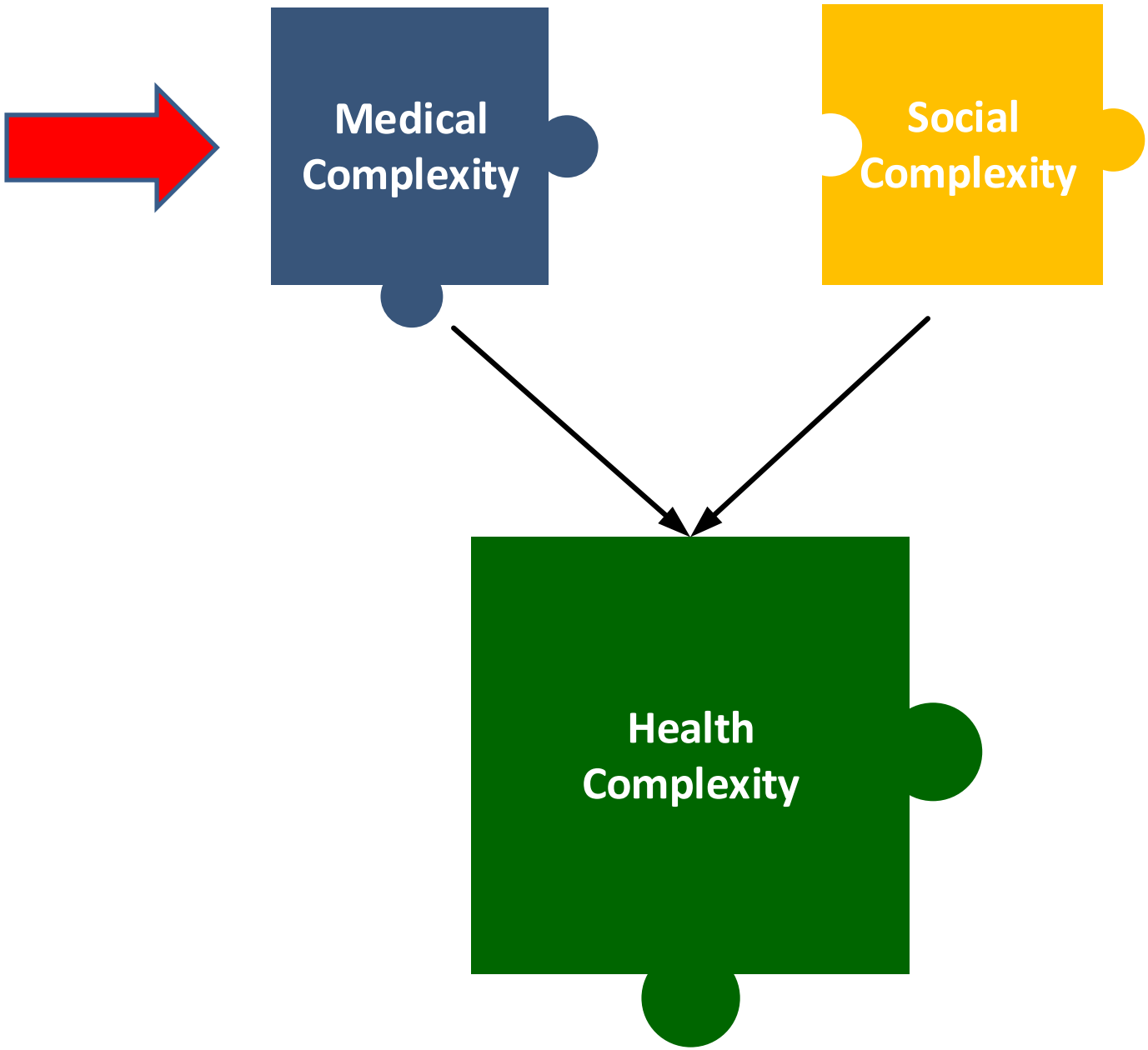
- **Medical Complexity**
  - Defined using the Pediatric Medical Complexity Algorithm (PMCA)
    - Takes into account: 1) Utilization of services, 2) Diagnoses, 3) Number of Body Systems Impacted
    - Assigns child into one of three categories: a) Complex with chronic conditions; b) Non-Complex, with chronic conditions; or c) Healthy.

- **Social Complexity:**
  - Defined by The Center of Excellence on Quality of Care Measures for Children with Complex Needs (COE4CCN) as:

    "A set of co-occurring individual, family or community characteristics that can have a direct impact on health outcomes or an indirect impact by affecting a child's access to care and/or a family's ability to engage in recommended medical and mental health treatments"
  - Our work incorporates factors identified by *COE4CCN* as predictive of a **high-cost health care event** (e.g. emergency room use).

➢ Health Complexity

- Combines medical and social complexity to create global understanding of children's health and needs


Medical Complexity
Social Complexity
Health Complexity

Pediatric Medical Complexity Algorithm

- Developed by a team at Seattle Children's, Validated by Center of Excellence on Quality of Care Measures for Children with Complex Needs (COE4CCN)
  - For children 0 to 18 insured
  - Developed as a way to identify a population, stratify quality metrics, and to target patients who may benefit from complex care management
  - Intentionally meant to address issue with CDPS
- Based on claims and diagnosis
- Categorizes complexity into three categories:
  1) **Complex Chronic Disease,**
  2) **Non-Complex Chronic Disease, and**
  3) **Healthy**
- The three categories are co-linear with COST (*i.e. as complexity increases, so does cost*)

Pediatric Medical Complexity Algorithm Findings

Statewide Publicly Insured: N=390582

1. Complex Chronic Disease: 6.1%

   N=23,681

2. Non-Complex Chronic Disease: 18.3%

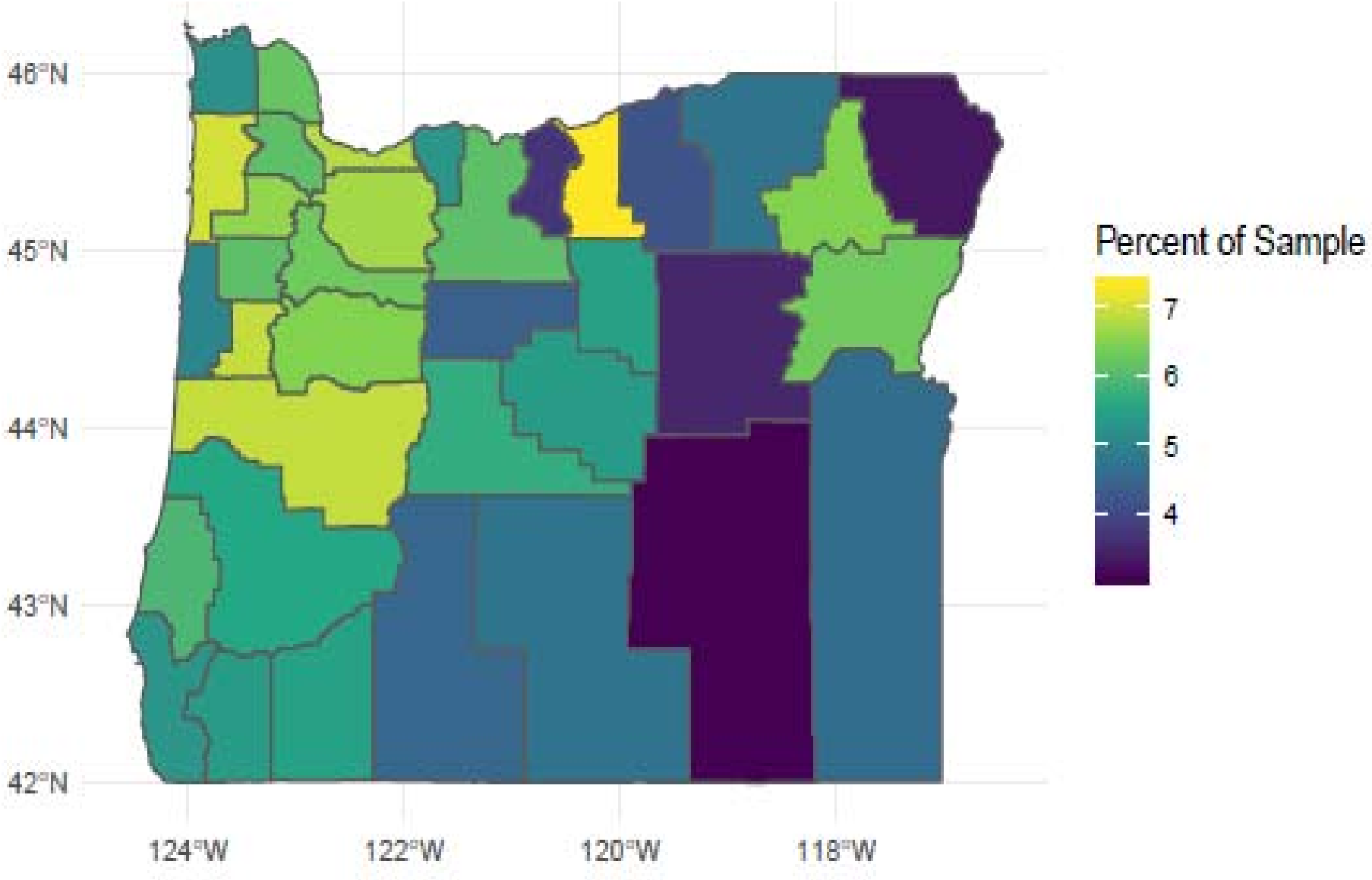
   N=71,591

24.4%

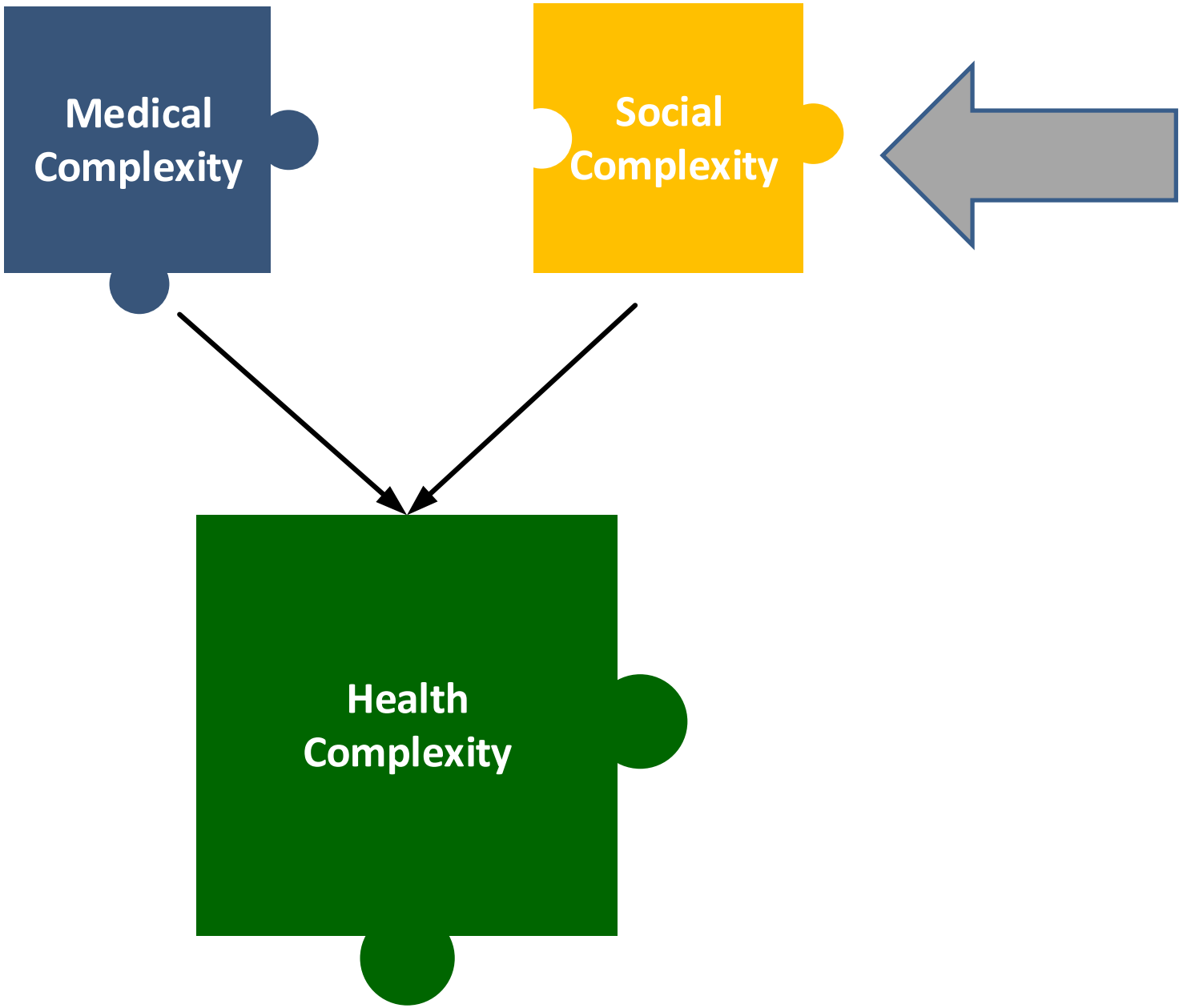
3. Healthy: 75.6%

*There is a **statistically significant** difference in the distribution of the three PMCA Categories **across counties** in Oregon.*

Complex, Chronic



Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)


Medical Complexity
Social Complexity
Health Complexity

18 Social Complexity Factors Identified by the Center of Excellence on Quality of Care Measures for Children with Complex Needs (COE4CCN) as Associated in Literature with Worse Health Outcomes and Costs

- 12 SC risk factors from literature review related to **worse outcomes**

1. Parent domestic violence
2. Parent mental illness
3. Parent physical disability
4. Child abuse/neglect
5. Poverty
6. Low English proficiency
7. Foreign born parent
8. Low parent educational attainment
9. Adolescent exposure to intimate partner violence
10. Parent substance abuse
11. Discontinuous insurance coverage
12. Foster care

- COE4CCN studies showed worse outcomes or consensus on impact:

13. Parent death
14. Parent criminal justice involvement
15. Homelessness
16. Child mental illness
17. Child substance abuse treatment need
18. Child criminal justice involvement

Identifying Feasible Social Complexity Variables in Oregon

Children with

Social Complexity

Children Identified & Classifications Used: A Social Complexity Count and Categorical Variable (indicating the number of social complexity risk factors identified) will be created based on available aligned with the definition of social complexity and the 18 social complexity factors associated with higher health care costs*. Social complexity is defined as "a set of co-occurring individual, family, or community characteristics that have a direct impact on health outcomes or an indirect impact by affecting a child's access to care and/or a family's ability to engage in recommended medical and mental health treatments".* Twelve feasible indicators, present during the prenatal period-lifetime of the child, include in the social complexity count are the: Child and/or Family use of TANF, Foster Care Services, Parent death, Parent incarceration, Child received mental health services, Child received substance abuse services, Parent received mental health services, Parent received substance abuse Services. Child abuse and neglect ICD-9, ICD-10 Codes, Primary Preferred Language is Not-English, Parent Disability as indicated by Medicaid Eligibility.

Standardized Scoring & Reporting Method: OPIP and OHA are developing methodologies to create two new variables which provide summary information, that is blinded, about the number of social complexity risk factors: 1) A count variable of the 12 social complexity variables, 2) A categorical variable, based on the social complexity count, that will be used for any child-level data sharing that meets data sharing requirements.

Data Sources: Three: 1) OHA Program Eligibility, 2) Administrative data used for Chronic Illness and Disability Payment System (CDPS), & 3) Integrated Client Services (ICS) Data Warehouse for the child and their parents.

- Collaboration between OHA & DHS; staffing support
- Data sources from OHA- Health Analytics and Integrated Client Data Warehouse (ICS)
  - ICS includes data across the Oregon Department of Human Services (DHS) and OHA client-based services. Includes data from the following DHS Programs: Aging and People with Disabilities, Child Welfare, Developmentally Disabled, Self-Sufficiency, Vocational Rehabilitation. Includes data from the following OHA Programs: Alcohol and Drug (AD), Contraceptive Care (C-Care), Family Health Insurance Assistance Program (FHIAP), Healthy Kids Connect (HKC), Medical Assistance Programs (MAP), Mental Health (MH), Women Infants Children (WIC). Includes data from the following external agencies: Department of Corrections (DOC), Oregon Housing and Community Services.
- Data sharing agreements
- Linkage of the child and parent to allow for child-level and population-level analysis
- Input obtained from public and private stakeholders in November 2017 and April 2018 about data methodologies

DHS Oregon Department of Human Services | Oregon Health Authority | OPIP

Social Complexity Findings

Import Notes About Data Being Shown:

- Look Back Period for Factors from ICS: Presence of the risk factor in prenatal period (Year before birth)-Lifetime of the Child OR since variable in database
- For "Family" indicators: Linkage of publicly insured children to a parent in ICS:
  - Unable to link to a parent: 20.44%
  - 1 parent: 11.62%
  - 2 Parents: 67.94%
- For the aggregate population-level reports: State, CCO and County-Level:
  - Reporting of prevalence of individual factors in the aggregate data reports.
- For the child-level data file to be sent to CCO for their attributed population, the variables **are blinded** and indicate the number of risk factors, but do NOT indicate WHICH specific indicators.
  - ❖**Three Social** Complexity Count Variable: Child (0-5), Family (0-7) and Total (0-12)

Fall 2018: Available and Feasible Social Complexity Indicators Included in a Social Complexity County Variable and Social Complexity Categorical Variable

INDICATOR	CHILD FACTOR	FAMILY FACTOR	TOTAL
Poverty –TANF (For Child and For Either/Both Parent)	X	X	X
Foster care – Child receiving foster care services DHS ORKids (since 2012)	X		X
Parent death – Death of parent/primary caregiver in OR		X	X
Parental incarceration – Parent incarcerated or supervised by the Dept. of Corrections in Oregon.		X	X
Mental Health: Child – Received mental health services through DHS/OHA	X		X
Mental Health: Parent – Received mental health services through DHS/OHA		X	X
Substance Abuse: Child – Substance abuse treatment through DHS/OHA	X		X
Substance Abuse: Parent – Substance abuse treatment through DHS/OHA		X	X
Child abuse/neglect: ICD-9, ICD-10 dx codes related to service	X		X
Limited English Proficiency: Language other than English listed in the primary language field		X	X
Parent Disability: OHA eligibility due to parent disability		X	X
Total Number of Individual Flags Included	**5**	**7**	**12**

Look Back Period for Factors Derived from ICS: Presence of the risk factor in prenatal period (year before birth)-lifetime of the child.

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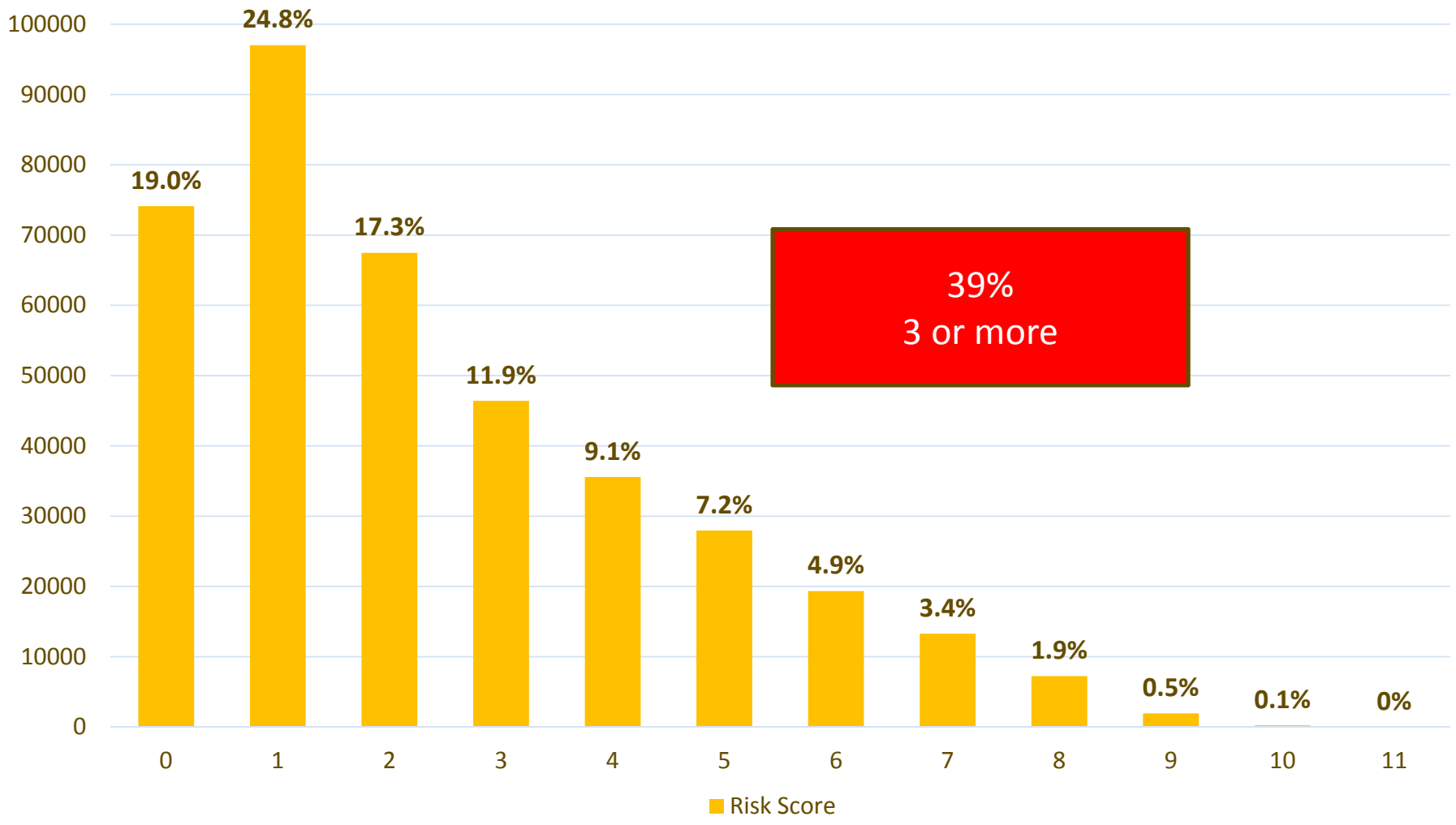
State-Level: Findings on Prevalence of Each Social Complexity Variable

INDICATOR	CHILD FACTOR	FAMILY FACTOR
Poverty – TANF (for Child and by Parent)	**40.6%** (158,650)	**31.2%** (121,952)
Foster Care – Child receiving foster care services DHS ORKids (since 2012)	**13%** (50,672)	
Parent Death – Death of parent/primary caregiver in OR		**1.3%** (5,172)
Parental Incarceration – Parent incarcerated or supervised by the Dept. of Corrections in Oregon		**19.1%** (74,707)
Mental Health: Child – Received mental health services through DHS/OHA	**33.1%** (129,212)	
Mental Health: Parent – Received mental health services through DHS/OHA		**40%** (156,221)
Substance Abuse: Child – Substance abuse treatment through DHS/OHA	**4.5%** (17,763)	
Substance Abuse: Parent – Substance abuse treatment through DHS/OHA		**29%** (113,124)
Child Abuse/Neglect: ICD-9, ICD-10 dx codes related to service	**5.3%** (20,589)	
Limited English Proficiency: Language other than English listed as primary language		**20.5%** (80,262)
Parent Disability: OHA Eligibility Due to Parent Disability		**3%** (11,892)

Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

Look Back Period for Factors Derived from ICS: Presence of the risk factor in prenatal period (year before birth)-lifetime of the child.

Distribution of Social Complexity Factors



Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

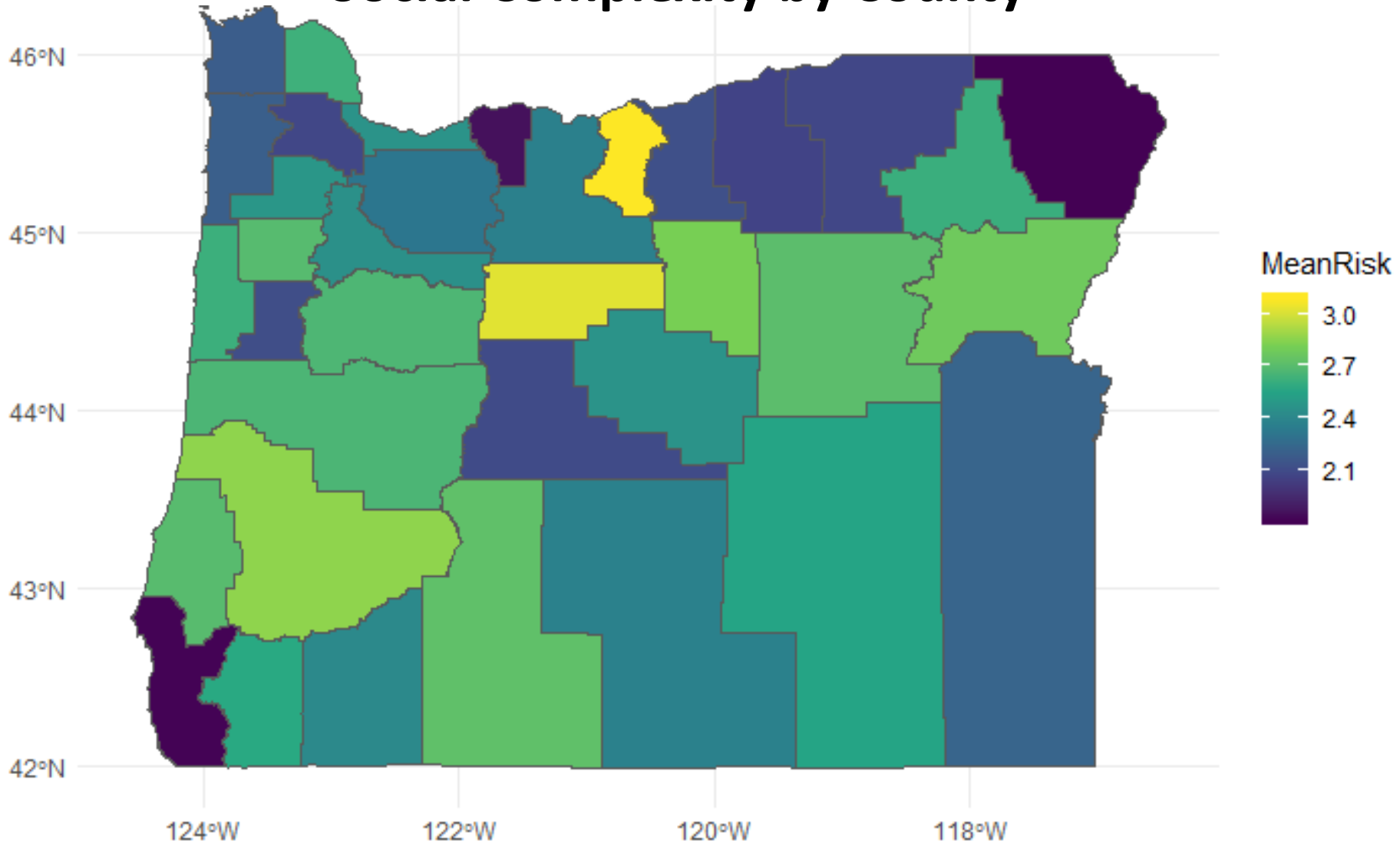
Putting the Data Into Perspective In Terms of the Number of Individual Children

Looking at the 0-17 Population:

- There are **N= 256** kids who have a **10 or 11**
  - More than the attendees of the meeting.
- When we look at the proportion of kids exposed to **3 or more** of the risk factors: **38.91% → 152,004 Kids**

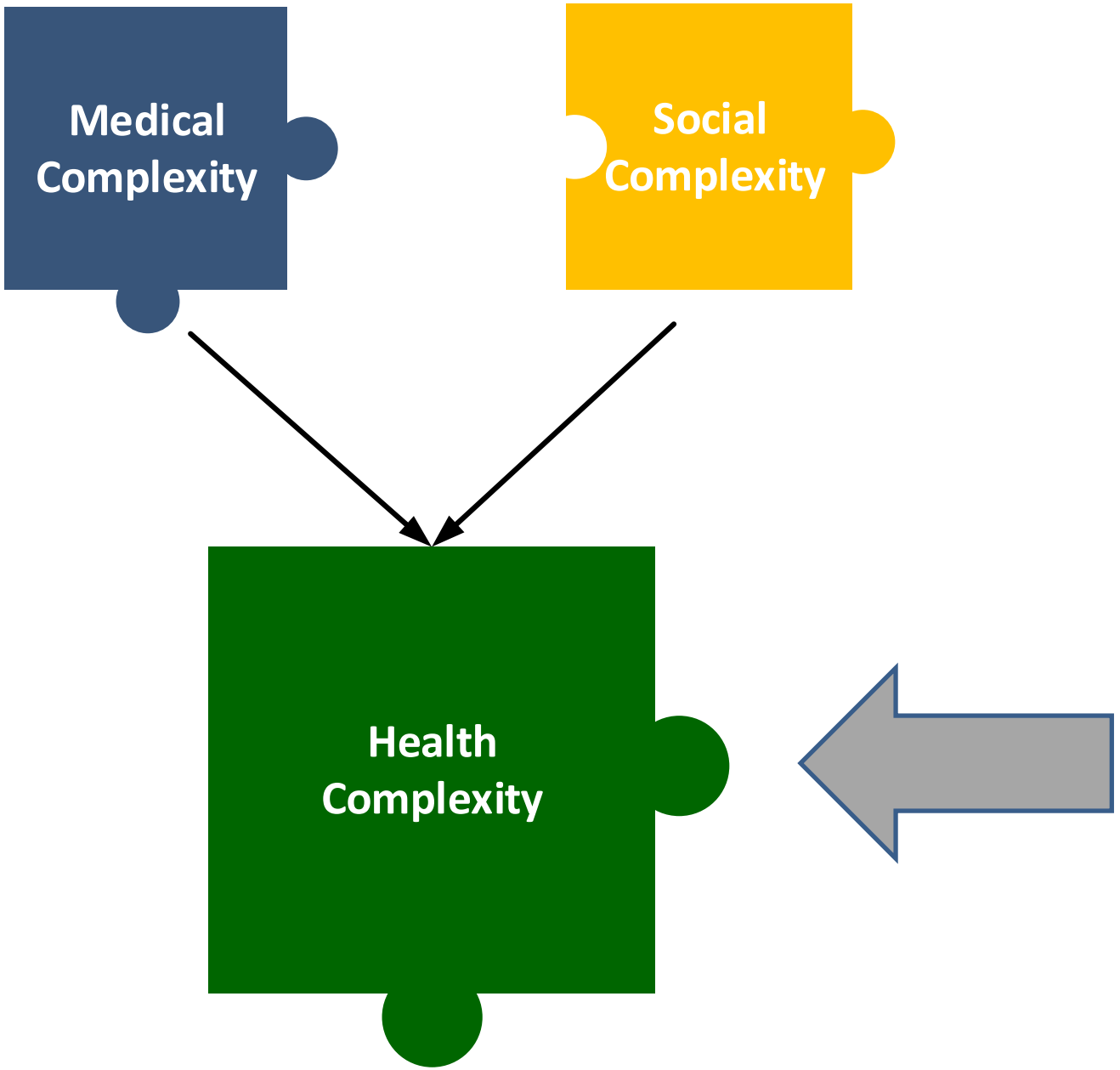
Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

Social Complexity by County



For the social risk score distribution (range: 0 - 11), there is a statistically significant difference in the social complexity indicator count between counties. (Kruskal-Wallis 2 = 4132.3,p < .001).

Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)


Medical Complexity
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Health Complexity Categorical Variable: Purpose and Goal

- Given that **medical** complexity and social complexity will be independently examined and shared, create a categorical variable that combines the unique and different information from each analysis.
  - Categories anchored to level of medical complexity AND level of social complexity
    - ❖ Understand the population with both levels of complexity
- Build off the learnings from the COE4CCN
  - 1 or more social complexity indicators associated with higher costs
  - The more factors present, the higher costs – Gradient effect
- Create a manageable level of categories for population-level aggregate reports that are aligned with the goal of the health complexity variable
  - That said, CCOs will have the fodder for the health complexity variable (child-level medical and social complexity categorical variables) and create their own versions depending on their intended uses.
- Ensure categories have sufficient denominators to allow for state and county-level reporting, maintain data sharing agreements when shared at a child-level

State-Level Health Complexity Categorical: Source Variables Related to Medical and Social Complexity

MEDICAL COMPLEXITY (3 Categories)	SOCIAL COMPLEXITY (Total Factors Possible in Preliminary Data Shown Here N=12)		
	3 or More Indicators	1-2 Indicators	None in System-Level Data
HIGH Medical Complexity (Chronic, Complex PMCA=1)	3% (11,637)	2.4% (9,342)	0.7% (2,702)
MODERATE Medical Complexity (Non-Complex, Chronic PMCA=2)	9.5% (36,908)	7.2% (27,952)	1.7% (6,731)
NO MEDICAL COMPLEXITY (PMCA=3)	26.5% (103,459)	32.6% (127,169)	Neither Medically or Socially Complex 16.6% (64,682)

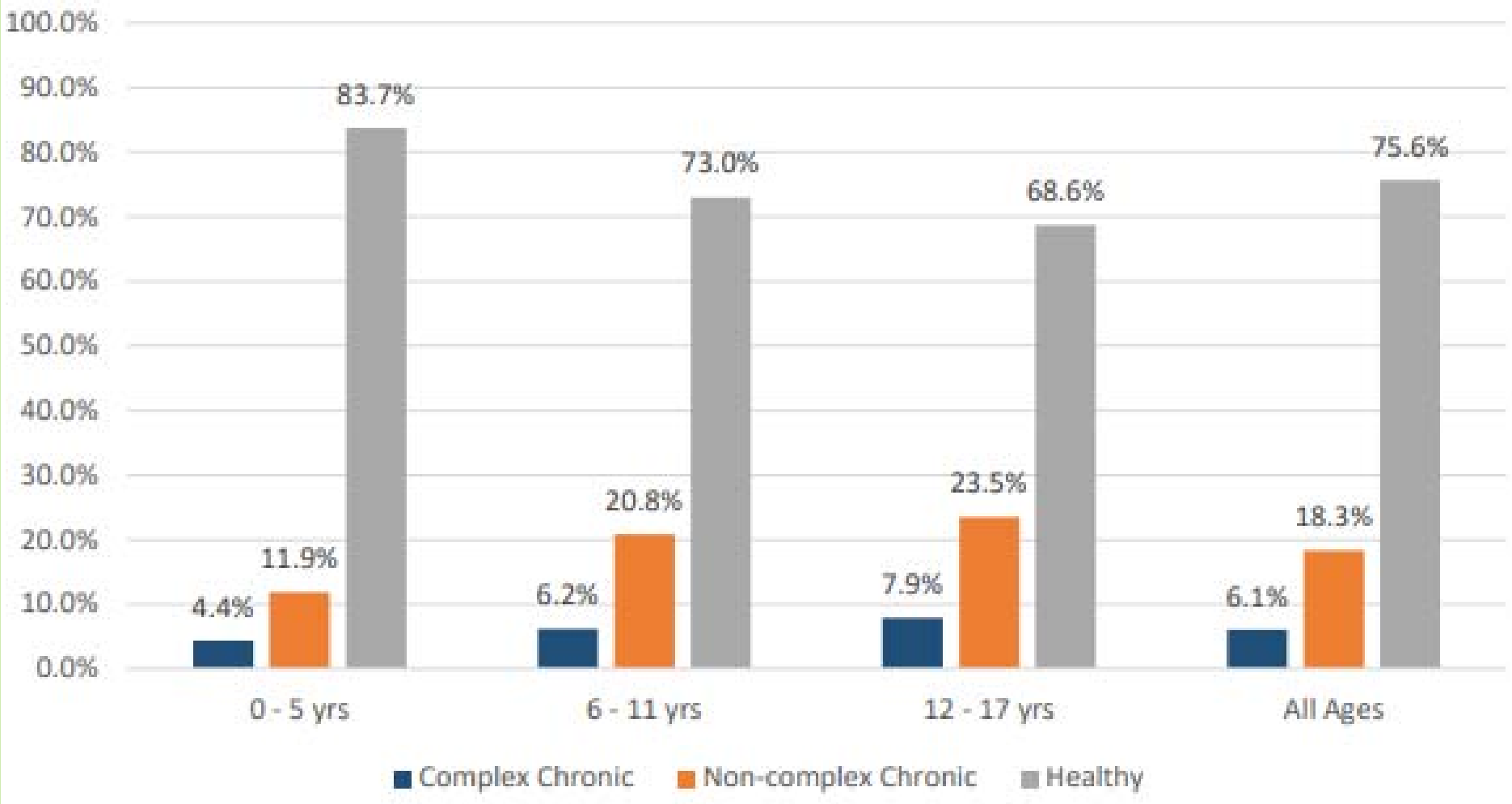
Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

Aggregate Data Reports Display the Data by Groups of Children

Data Displayed by:

- Three Age Groups
  - 0-5, 6-11, and 12-17 years old
- County
- Race (State- Level Report)
- Ethnicity (State- Level Report)

Pediatric Medical Complexity Algorithm Findings: By Age of Child



Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

Social Complexity By Age of Child

	Children 0-5 N=145,970		Children 6-11 N=118,965		Children 12-17 N=125,647	
	Child Factor	Parent Factor	Child Factor	Parent Factor	Child Factor	Parent Factor
Poverty –TANF (For Child and For Either/Both Parent)	**34.2%** (49,990)	**30.5%** (44,464)	**44.9%** (53,380)	**33.7%** (40,138)	**44.0%** (55,280)	**29.7%** (37,350)
Foster care – Child receiving foster care services DHS ORKids	**7.4%** (10,772)		**13.8%** (16,446)		**18.7%** (23,454)	
Parent death – Death of parent/primary caregiver in OR		**0.5%** (675)		**1.3%** (1,513)		**2.4%** (2,984)
Parental incarceration – Parent incarcerated or supervised by the Dept. of Corrections in Oregon		**17.5%** (25,604)		**20.7%** (24,674)		**19.4%** (24,429)
Mental Health: Child – Received mental health services through DHS/OHA	**14.2%** (20,779)		**36.8%** (43,753)		**51.5%** (64,680)	
Mental Health: Parent – Received mental health services through DHS/OHA		**44.1%** (64,419)		**40.6%** (48,350)		**34.6%** (43,452)
Substance Abuse: Child – Substance abuse treatment through DHS/OHA	**0.4%** (547)		**1.7%** (2,059)		**12.1%** (15,157)	
Substance Abuse: Parent – Substance abuse treatment through DHS/OHA		**29.0%** (42,387)		**30.5%** (36,248)		**27.4%** (34,489)
Child abuse/neglect: ICD-9, ICD-10 dx codes related to service	**4.9%** (7,224)		**5.6%** (6,625)		**5.4%** (6,740)	
Limited English Proficiency: Language other than English listed in the primary language field		**17.7%** (25,779)		**22.8%** (27,162)		**21.7%** (27,321)
Parent Disability: OHA eligibility due to parent disability		**2.4%** (3,561)		**3.0%** (3,553)		**3.8%** (4,778)

Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

Magnitude of Social Complexity for Children 0-5

Burden of social factors for publicly insured **children ages 0-5** (n=145,970):

- 3 or more : 33.4% = **48,804 children**
- 4 or more: 21.3% = **31,041 children**
- 5 or more: 12.4% = **18,155**

Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

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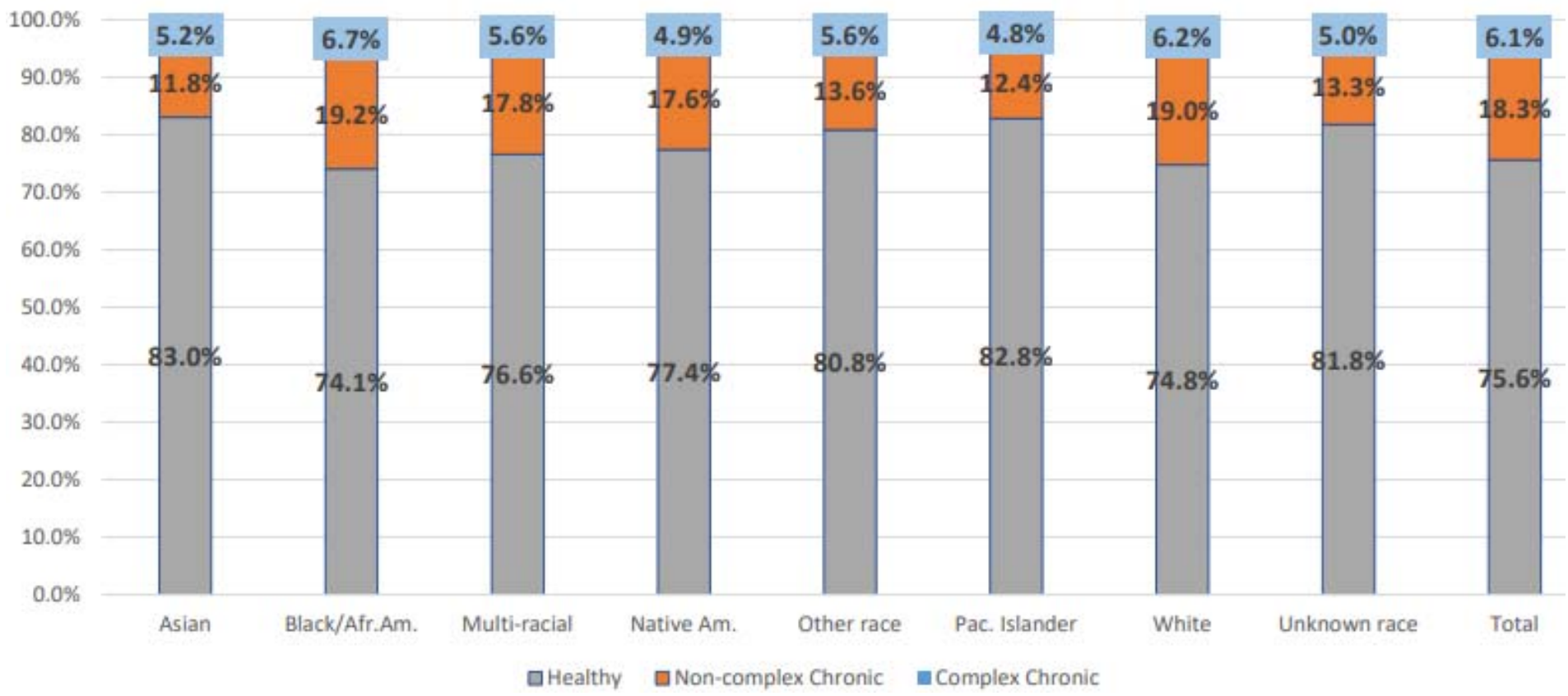
Population Race & Ethnicity

- Race
  - Asian: 2.9% (11232)
  - Black: 4.2% (16586)
  - Multiracial: 1.7% (6703)
  - Native American: 3.9% (15158)
  - Other: 3% (11586)
  - Pacific Islander: 0.7% (2882)
  - White: 80% (312636)
  - Unknown: 3.5% (13799)
- Ethnicity
  - Hispanic: 27.1% (105922)
  - Not-Hispanic: 72.8% (284218)
  - Unknown: 0.1% (442)

Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

Pediatric Medical Complexity Algorithm Findings: By Race



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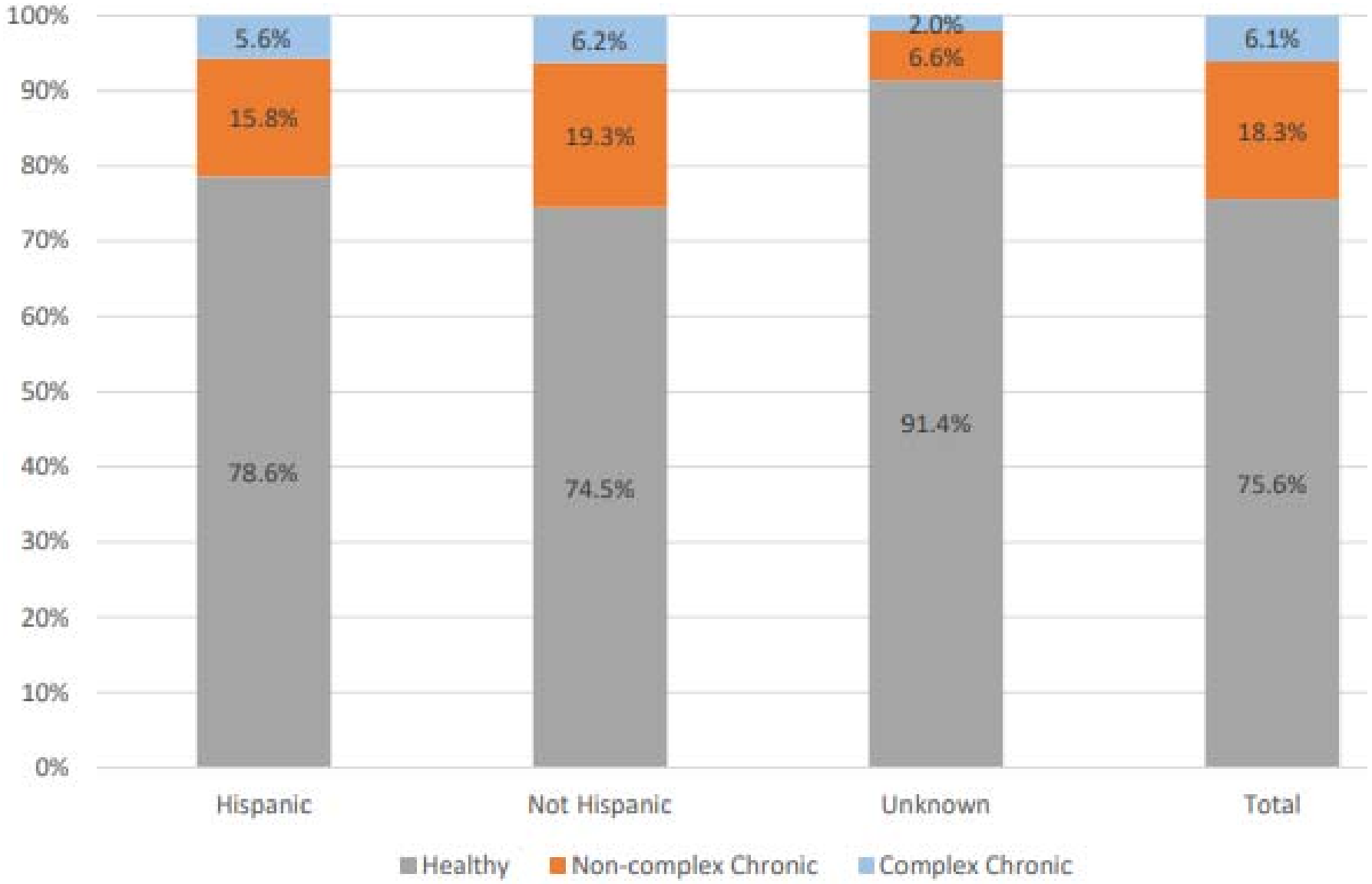
Pediatric Medical Complexity Algorithm Findings: By Ethnicity



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Social Complexity By Race

SOCIAL FACTORS	ASIAN	BLACK	MULTIRACIAL	NATIVE AMER	OTHER	PACIFIC ISL	WHITE	UNKNOWN
0	34.5% (3880)	11.5% (1914)	19.1% (1280)	12.8% (1937)	25.0% (2891)	33.7% (971)	18.6% (58286)	21.4% (2956)
1	36.1% (4051)	18.7% (3102)	27.4% (1838)	27.8% (4210)	39.4% (4570)	31.1% (897)	23.2% (72438)	42.8% (5900)
2	15.8% (1771)	18.3% (3041)	18.3% (1227)	19.3% (2926)	19.4% (2248)	16.5% (475)	16.9% (52827)	21.3% (2942)
3 or more	13.6% (1530)	51.4% (8529)	35.2% (2358)	40.1% (6085)	16.2% (1877)	18.7% (539)	41.3% (129085)	14.5% (2001)

Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

Health Complexity Rates by Race

HEALTH COMPLEXITY	ASIAN	BLACK	NATIVE AMER	OTHER	UNKNOWN	WHITE
Complex Chronic: 3+ social factors	0.9% (103)	4.0% (666)	2.5% (384)	1.3% (149)	1.1% (158)	3.2% (9974)
Complex Chronic: 1-2 social factors	3.1% (347)	2.2% (363)	2.0% (306)	3.5% (406)	3.2% (439)	2.3% (7243)
Complex Chronic: 0 social factors	1.2% (131)	0.5% (83)	0.4% (58)	0.8% (89)	0.6% (89)	0.7% (2181)
Non-complex: 3+ social factors	2.3% (256)	11.9% (1976)	8.4% (1280)	3.6% (415)	3.1% (424)	10.2% (31890)
Non-complex: 1-2 social factors	6.7% (753)	6.1% (1004)	7.9% (1196)	7.9% (913)	8.6% (1190)	7.1% (22220)
Non-complex: 0 social factors	2.8% (317)	1.3% (209)	1.3% (197)	2.1% (247)	1.6% (217)	1.7% (5334)
Healthy: 3+ social factors	10.4% (1171)	35.5% (5887)	29.2% (4421)	11.3% (1313)	10.3% (1419)	27.9% (87221)
Healthy: 1-2 social factors	42.0% (4722)	28.8% (4776)	37.2% (5634)	47.5% (5499)	52.3% (7213)	30.6% (95802)
Healthy: 0 social factors	30.6% (3432)	9.8% (1622)	11.1% (1682)	22.1% (2555)	19.2% (2650)	16.2% (50771)

Data Source: ICS Data Warehouse & Medicaid data sourced from Medicaid Management Information System (MMIS)

Data in Action: Reports and Data Sharing

Population of children publicly insured in 2016-2017:

1. **Population-Level Reports:** Aggregate Data (n=390,582)
   - Data shown for the population at state and **county-level**
   - Includes prevalence of specific indicators and by race & ethnicity
   - Three age groups: 0-5, 6-11, and 12-17 years old

2. **CCO Population-Level Report:** Aggregate Data
   - Data shown for the population at a CCO-Level and Across CCOs
   - Includes prevalence of specific indicators at a CCO-level

3. **To CCOs for Their Attributed Populations:** Child-Level Data File
   - Currently attributed population (smaller population)
   - Child-level indicator of:

   ❖ **Medical** Complexity Categorical Variable (3 categories),

   ❖ **Three Social** Complexity Count Variable: Child (0-5), Family (0-7) and Total (0-12)

   ❖ **Health** Complexity Categorical Variable (9 Categories that Map to Slides Shown)

Data in Action: Supporting CCOs and Communities to address children's health complexity

1. **Use the Population-Level Findings to Engage Community Partners** to:
   - Understand Child and Family Needs,
   - Identify Community-Level Assets, and
   - Address Capacity of Services to Serve Children with Health Complexity

2. **Use the Population and Child-Level Findings to Identify:**
   - Opportunities to Enhance Care Coordination and Care Management
   - Community-based and centralized supports for children with health complexity

3. **Leverage the Data to Support a Health Complexity Informed Approach with Front-Line Health Care Providers:**
   - Trauma informed and culturally responsive care
   - Explore role of health complexity in Value-based Payment models

Questions?

- ✓ http://www.oregon-pip.org/projects/Packard.html
- ✓ https://www.oregon.gov/oha/HPA/dsi-tc/Pages/Child-Health-Complexity-Data.aspx

- ✓ March 14th 10:30-11:30 Webinar with Kaiser Permanente Northwest on Health Complexity Informed approached to build Pediatric Care Together.
  - ❖ Register on Lucile Packard Foundation for Children's Health's website