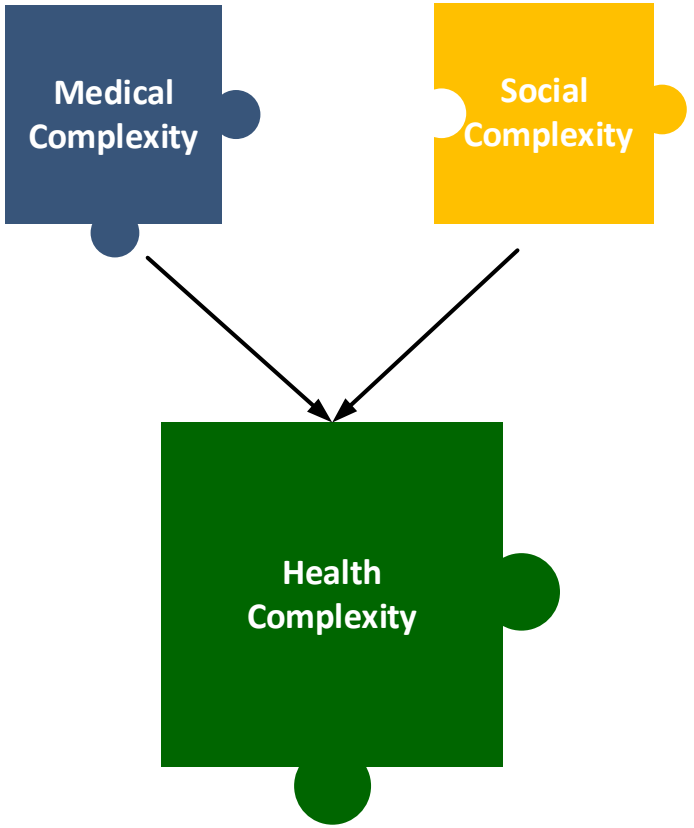
Health Complexity in Children – Cascade Health Alliance

March 2023

Introduction

The goal of this report is to provide a summary of system-level data about children with health complexity in the Oregon Health Plan (OHP, Medicaid) and Children's Health Insurance Program (CHIP). This report has data specific to this CCO's population. It contains data for children who are enrolled in this CCO as of January 2023. The cohort of this dataset includes all children enrolled in Medicaid/CHIP ages 0 through 20 as of January 31, 2023. For measuring medical complexity using the Pediatric Medical Complexity Algorithm (PMCA), the data set has a look back at claims data from the All Payer All Claims (APAC) database for these children from January 1, 2019 through December 31, 2021. For measuring social complexity, the look back period for these indicators is the lifetime of the child plus one year prior to birth when available.



Health complexity is a concept that takes into account both the child's medical and social complexity. The methodology for these reports was developed in partnership with the Oregon Pediatric Improvement Partnership (OPIP). These reports were produced by the Oregon Health Authority (OHA) and the Oregon Department of Human Services (ODHS). For more information, please see: Reuland CP, Chiang L, Collins J, Hargunani D, Shinde D, Stewart V, Coon C, Lierman W, Cochran A. Putting a Spotlight on Children with Health Complexity: Overview of a Novel and Applied Methodology to Identify Children with Health Complexity in order to Inform Investments & Improvements. Oregon Health Authority System Brief 2019.

OPIP

DHS Oregon Department of Human Services

Oregon Health Authority

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Medical Complexity

Background

To measure medical complexity, we are using the Pediatric Medical Complexity Algorithm (PMCA), which was developed by a team at Seattle Children's Hospital and validated by the Center of Excellence on Quality of Care Measures for Children with Complex Needs (COE4CCN). This report uses PMCA version 3.2, and OHA will use updated PMCA versions for future reports as they become available. The PMCA was run using three years of data and using the more conservative version of the algorithm. **Claims from January 1, 2019 through December 31, 2021 were pulled for a three-year total period.** Please refer to Methodology and Data Sources section on page 10 for more information on updated changes for this data report.

The PMCA takes into account 1) Utilization of services, 2) Diagnoses, and 3) Number of body systems impacted, and assigns children into one of three categories:

1. Children with Complex Chronic Disease
2. Children with Non-Complex Chronic Disease
3. Children without Chronic Disease/Healthy

The three categories are co-linear with cost, so as complexity increases so does cost.

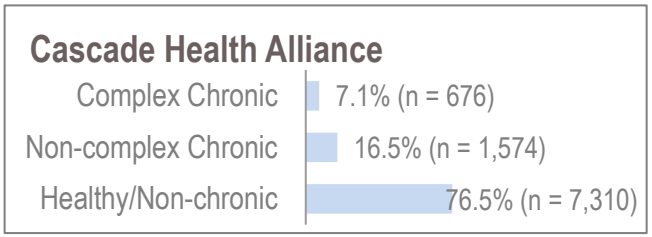
PMCA is based on utilization and coding, so it does not capture children who 1) are not accessing services, 2) cannot access specialized services, and/or 3) have diagnoses that were not coded, meaning medical complexity information is not in the data that we have access to.

For more information about the PMCA:
https://www.kpwashingtonresearch.org/our-research/our-scientists/rita-mangione-smith-md-mph/measurement-tools-research-dr-rita-mangione-smith

Medical Complexity: Summary of Data and Key Findings

This dataset includes 9,560 children enrolled in Cascade Health Alliance as of January 2023.

- 7.1% of children were placed into the PMCA 1 complex chronic disease category.
- 16.5% of children were placed into the PMCA 2 non-complex chronic disease category.
- 76.5% of children were placed into the PMCA 3 healthy/non-chronic category.
- **23.5% of children had some level of medical complexity (PMCA categories 1 or 2).**



Among the 16 CCOs in Oregon, there was a wide range in the percent of children placed into each medical complexity category:

- The percentage of **complex chronic children** ranged from 5.9% (lowest) to 11.0% (highest) with a statewide value of 9.7%.
- The percentage of **non-complex chronic children** ranged from 11.6% (lowest) to 20.9% (highest) with a statewide value of 18.0%.
- The percentage of **healthy/non-chronic children** ranged from 68.1% (lowest) to 82.4% (highest) with a statewide value of 72.3%.

Social Complexity

Background

Social complexity is defined by COE4CCN 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”. COE4CCN identified 18 factors that either in past literature or through their own studies were correlated with worse health outcomes or higher health care costs. Anchored to those factors, OPIP and OHA then examined specific indicators that existed or could be collected in Oregon’s Medicaid or Integrated Client Services (ICS) data. Twelve different social indicators, described in the following table, were identified as feasible to be collected for each child. These indicators were based on services the child received or claims attributed to the child, services that one or both parents of the child received, or information obtained from OHA Medicaid Enrollment or OHA Vital Statistics; when available, the look back period for these indicators is the lifetime of the child plus one year prior to birth (to account for the prenatal period). A summary count of the number of social complexity indicators was then created. Secondly, a three-part social complexity categorical variable (3 or more, 1-2, or 0 risk factors) was then created.

For **24%** of children in the statewide dataset, it was not possible to link the child to either parent. Therefore, these children only have data available for the five child-level social complexity indicators.

For more information about data sources and the time period of available data for the social complexity indicators used in this report, please refer to the data dictionary: https://www.oregon.gov/oha/HPA/dsi-tc/Documents/DataDictionary-Social-Indicators.pdf

Social Complexity

Social Complexity Indicators Within 2022 Health Complexity Indicator

INDICATOR: Descriptive Information* (Source)	CHILD FACTOR	FAMILY FACTOR	TOTAL
POVERTY – CHILD: Access of Temporary Assistance for Needy Families (TANF), below 37% federal poverty level (ICS, data available 2001-2022)	X		X
POVERTY- PARENT: Access of TANF (ICS, data available 2000-2022)		X	X
FOSTER CARE: Child received child welfare services (ICS, data available 2000-2022)	X		X
PARENTAL DEATH: Death of parent in OR (ICS-Death Certificate in Oregon, data available 1989-2022)		X	X
PARENTAL INCARCERATION: Parent incarcerated or supervised by the Dept. of Corrections in Oregon (ICS-Department of Corrections for state felony, not including county/municipal charges, data available 2000-2022)		X	X
MENTAL HEALTH – CHILD: Child received mental health services through DHS/OHA (ICS-NMH Caseloads, data available 2000-2022)	X		X
MENTAL HEALTH – PARENT: Parent received mental health services through DHS/OHA (ICS-NMH Caseloads, data available 2000-2022)		X	X
SUBSTANCE USE DISORDER – CHILD: Child received substance abuse treatment through DHS/OHA (ICS-AD Caseloads, data available 2000-2022)	X		X
SUBSTANCE USE DISORDER – PARENT: Parent received substance abuse treatment through DHS/OHA (ICS-AD Caseloads, data available 2000-2022)		X	X
CHILD ABUSE AND NEGLECT: ICD-9, ICD-10 dx codes used by providers (OHA Medicaid claims data, data available 2000-2022)	X		X
POTENTIAL LANGUAGE BARRIER: Language other than English listed in the primary language field (OHA Medicaid Enrollment, most current data for family)		X	X
PARENTAL DISABILITY: Parent is eligible for Medicaid due to a recognized disability (OHA Medicaid Enrollment, most current data for family)		X	X
TOTAL NUMBER OF INDIVIDUAL FLAGS	**5**	**7**	**12**

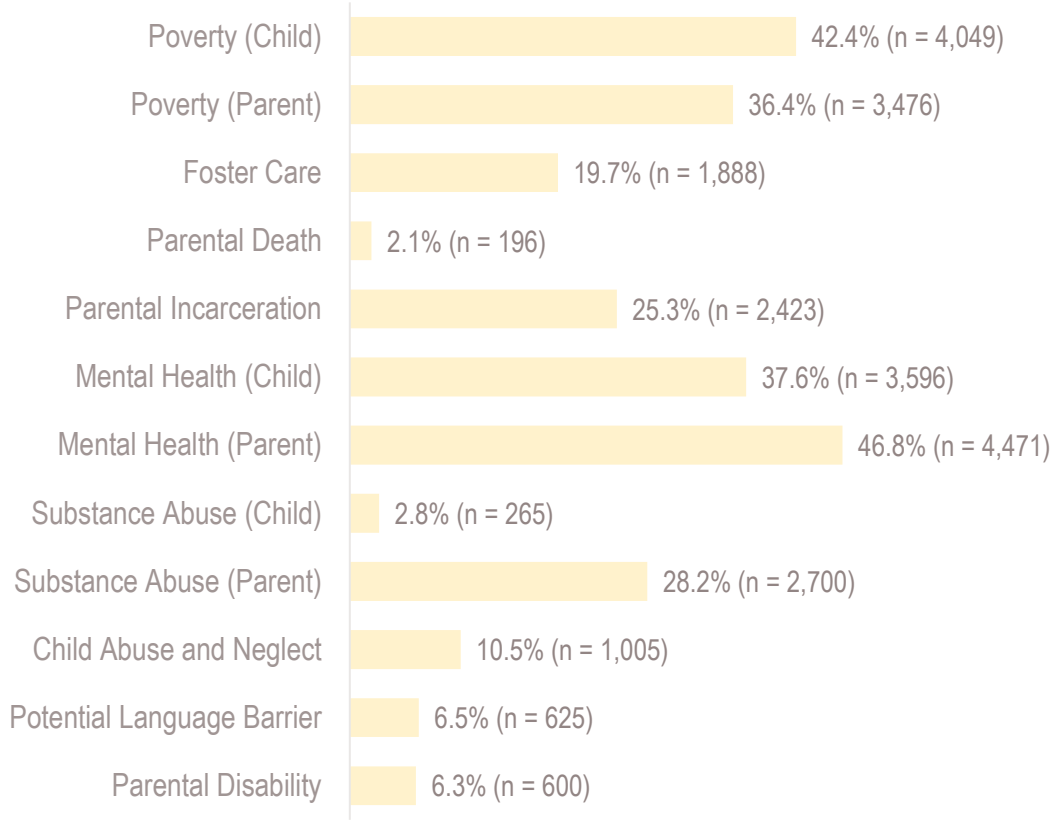
* Look back period includes prenatal period through the lifetime of child, unless an exception is noted due to availability of data.

Social Complexity

Social Complexity: Summary of Data and Key Findings

Social complexity indicators

Cascade Health Alliance
(n = 9,560)



Note: Due to reporting rules from ICS, populations with low counts (n ≤ 10) are masked and reported as NA. For **24%** of children in the statewide dataset, it was not possible to link the child to either parent. Therefore, these children only have data available for the five child-level social complexity indicators.

Social Complexity

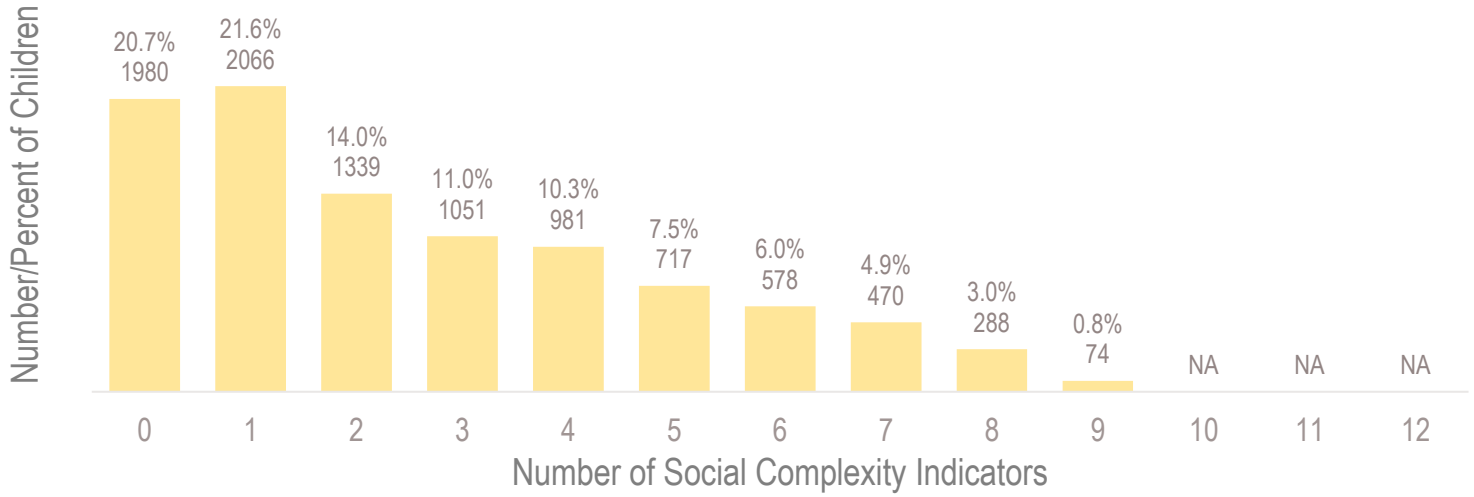
Social Complexity: Summary of Data and Key Findings

There was an average of 2.4 social complexity indicators per child across the state. In other words, the average child had 2.4 social complexity indicators. Average CCO values ranged from 1.7 to 2.9 social complexity indicators per child.

Distribution of social complexity indicators: % (n)

Cascade Health Alliance

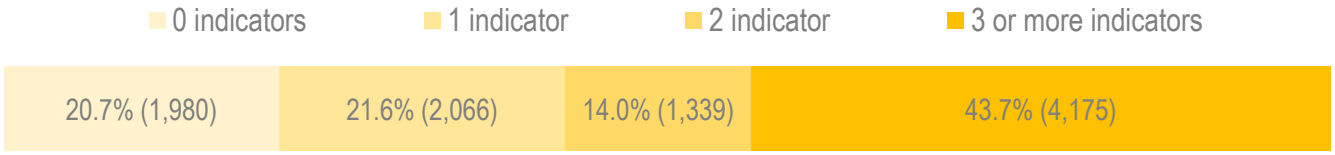
(n = 9,560)



Number of social complexity indicators: % (n)

Cascade Health Alliance

(n = 9,560)



Health Complexity

Background

Medical complexity and social complexity are combined to create a metric of health complexity. The health complexity variable describes the degree to which the child has both medical and social complexity. This is important because the level and type of supports that are needed for children with high medical and social complexity are very different than the level and type of supports that would be useful for a child with low medical and low social complexity. The categories created combine the existing three categories for the PMCA with three categories based on the social complexity count: Children with 3 or more social risk indicators, children with 1-2 risk indicators, and children with no social risk indicators. These categories were chosen because children with 1 or more social risk indicators have been shown to have social complexity, and children with more risk factors are shown to be at a greater risk. The goal is to identify the population with both levels of complexity.

Health Complexity: Summary of Data and Key Findings

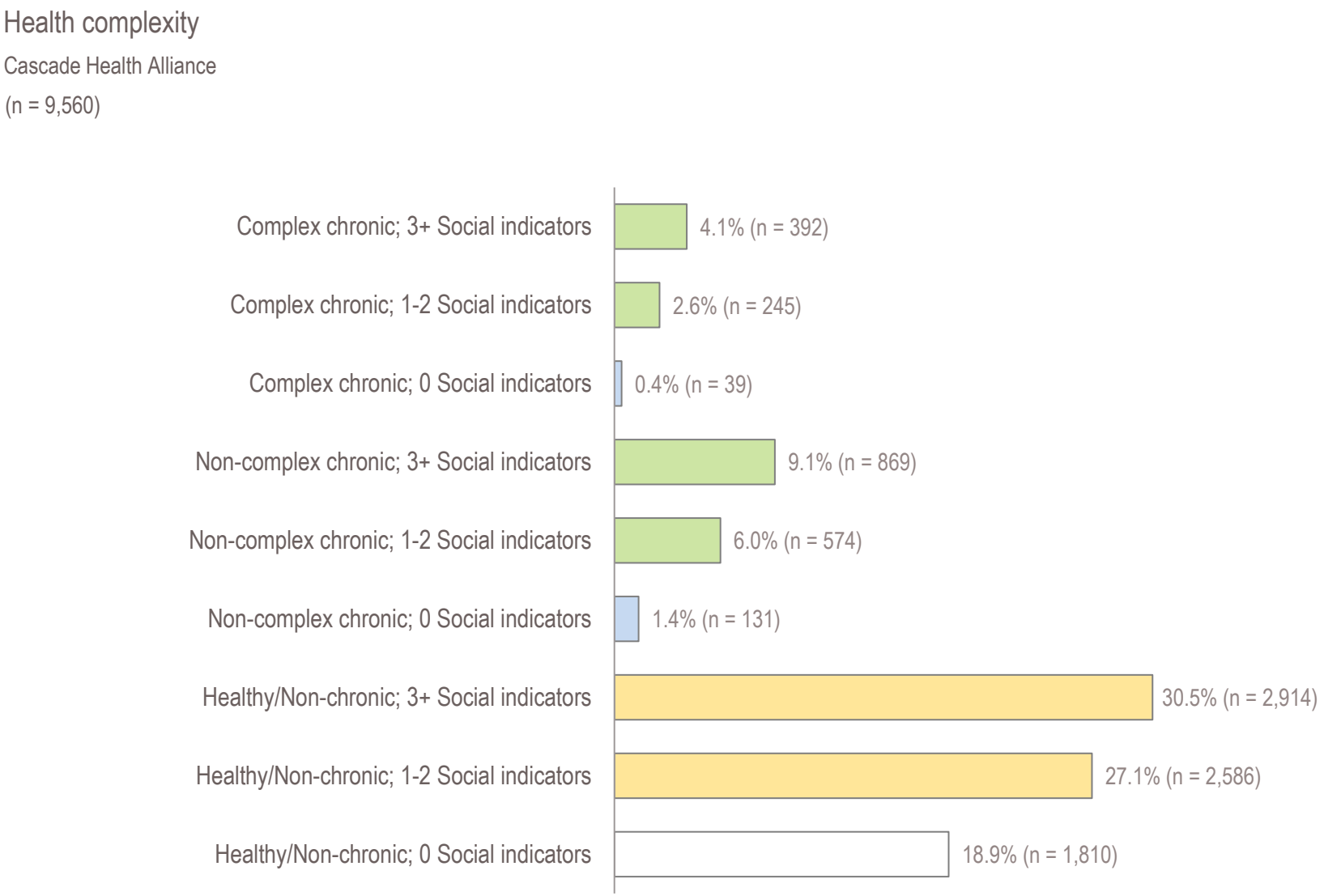
Health Complexity: % (n)		Social Complexity (12 indicators maximum)		
		3 or more indicators	1-2 indicators	None in System-Level Data
Medical Complexity (3 Categories)	Complex Chronic	4.1% (392)	2.6% (245)	0.4% (39)
	Non-Complex Chronic	9.1% (869)	6.0% (574)	1.4% (131)
	Healthy / Non-Chronic	30.5% (2,914)	27.1% (2,586)	18.9% (1,810) Neither medically nor socially complex

Decreasing medical complexity ↓

Decreasing social complexity →

Health Complexity

Health Complexity: Summary of Data and Key Findings



Methodology and Data Sources

The same methodology was used as the previous year:

1. This round of reports uses All Payer All Claims (APAC) data from all payer groups (Commercial, Medicaid and Medicare) to determine medical complexity, using PMCA version 3.2. The use of APAC provides additional claims and data, especially for those children who have dual coverage. Only children enrolled in Medicaid or CHIP are included in the dataset.

2. This dataset includes children ages 0 through 20. On these reports, there is an age group category for children 18-20 years old, in part to align with standard definitions of children that extend up to 20 years old and to enhance support focused on adolescents transitioning to adulthood.

3. The cohort of this dataset includes all children enrolled in Medicaid/CHIP between 0 through 20 years of age as of January 31, 2023 and for PMCA calculations has a look back at claims data for these children from January 1, 2019 through December 31, 2021. This methodology preserves the 3-year claims data as in previous datasets and allows the reports to include a more up-to-date cohort of children.

4. The dataset does not have a continuous enrollment criteria, whereas previous reports required children to be enrolled for two months in order to be attributed.

Data sources for this dataset include:

1. For PMCA calculations, the All Payer All Claims (APAC) database - Data from January 1, 2019 through December 31, 2021 were used.

2. The ICS data warehouse, which includes data from:
    a) *DHS programs*: Aging and People with Disabilities, Child Welfare, Developmentally Disabled, Self-Sufficiency, and Vocational Rehabilitation
    b) *OHA programs*: Alcohol and Drug, Contraceptive Care, Family Health Insurance Assistance Program, Healthy Kids Connect, Medical Assistance Program, Mental Health, Women Infants Children
    c) *External agencies*: Department of Corrections, Oregon Housing and Community Services

For more information about Health Complexity, please visit: OHA: https://www.oregon.gov/oha/HPA/dsi-tc/Pages/Child-Health-Complexity-Data.aspx and OPIP: https://oregon-pip.org/our-projects/health-complexity-data/

For information about Medical Complexity and the Pediatric Medical Complexity Algorithm (PMCA), please visit: https://www.kpwashingtonresearch.org/our-research/our-scientists/rita-mangione-smith-md-mph/measurement-tools-research-dr-rita-mangione-smith

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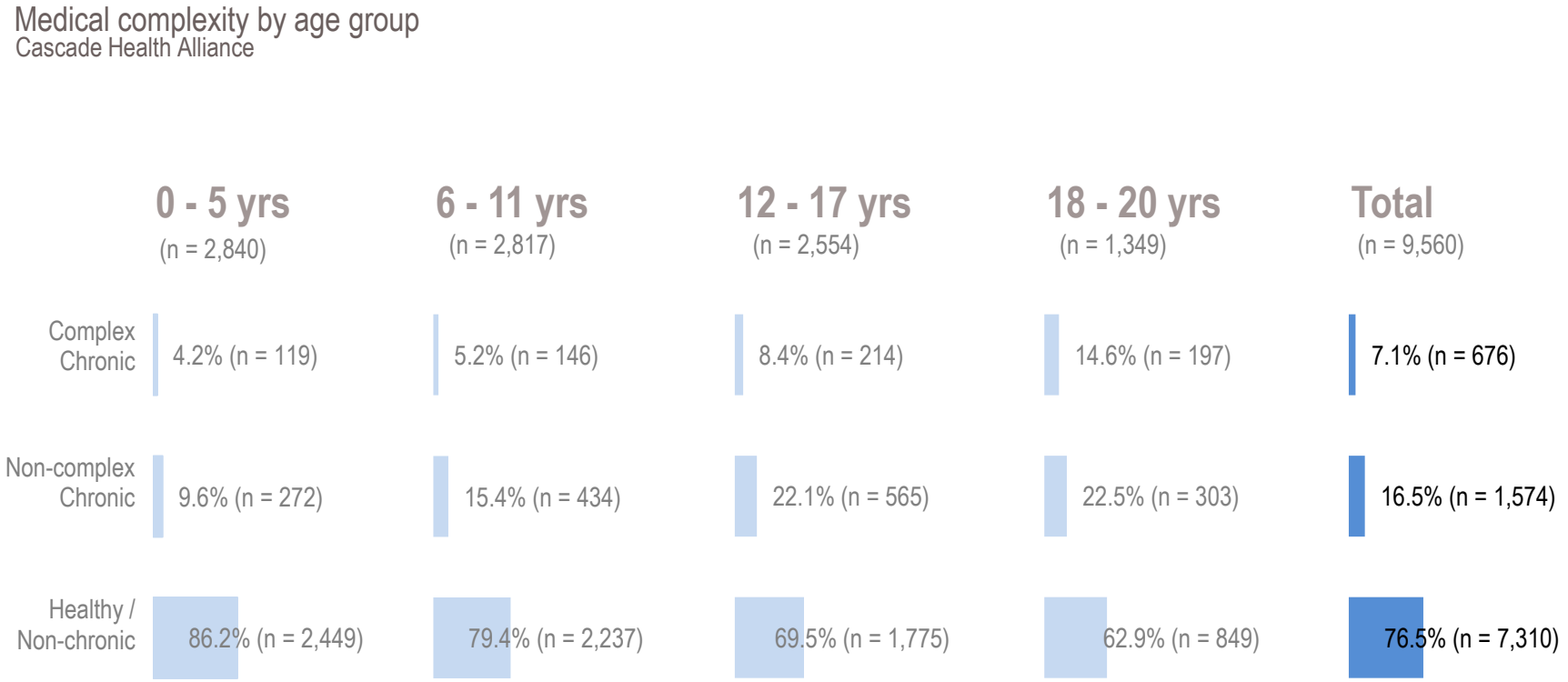
For questions about this report please email: HealthComplexity.Program@oha.oregon.gov

Appendix: Medical, Social, and Health Complexity by Age Group



Appendix continued: Medical, Social, and Health Complexity by Age Group

Social complexity by age group

Cascade Health Alliance

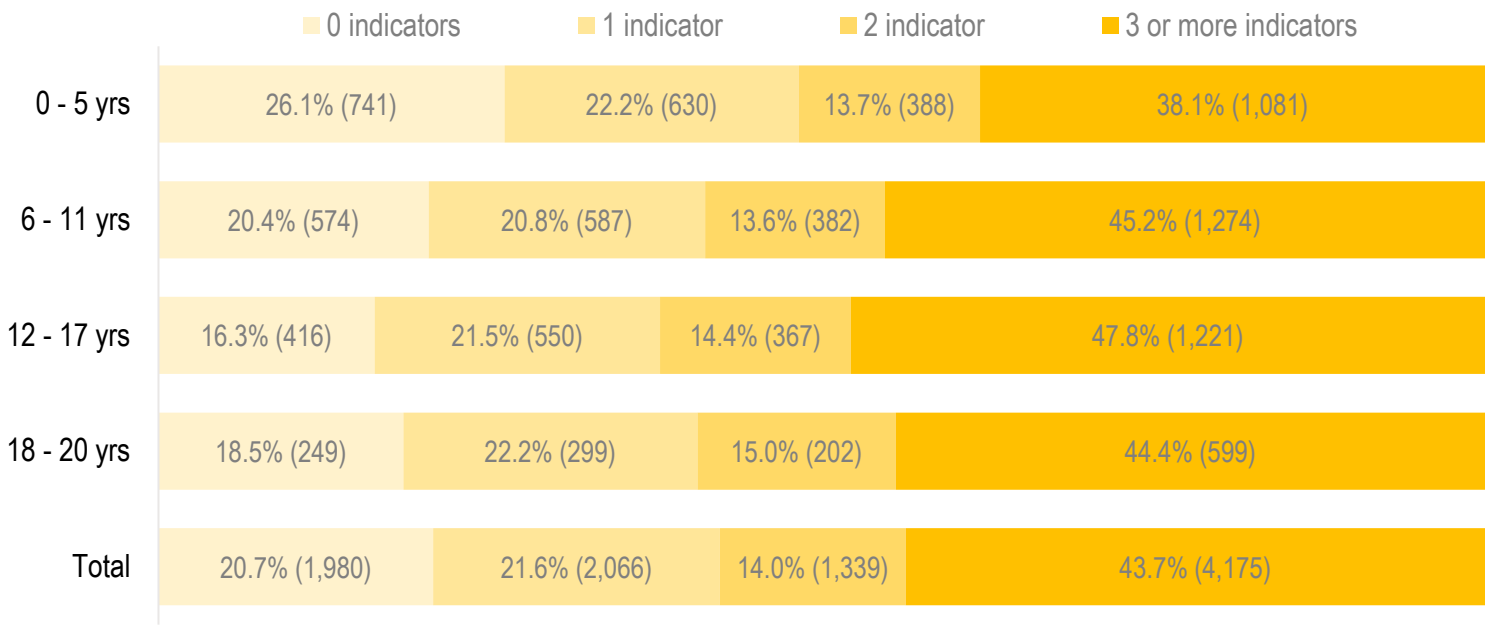
	0 - 5 yrs (n = 2,840)	6 - 11 yrs (n = 2,817)	12 - 17 yrs (n = 2,554)	18 - 20 yrs (n = 1,349)
Poverty (Child)	32.7% (n = 928)	46.9% (n = 1,320)	47.8% (n = 1,221)	43.0% (n = 580)
Poverty (Parent)	39.3% (n = 1,116)	39.4% (n = 1,111)	33.9% (n = 866)	28.4% (n = 383)
Foster Care	13.0% (n = 370)	21.5% (n = 606)	23.9% (n = 610)	22.4% (n = 302)
Parental Death	1.0% (n = 28)	1.5% (n = 41)	2.7% (n = 68)	4.4% (n = 59)
Parental Incarceration	23.0% (n = 652)	26.3% (n = 740)	27.6% (n = 704)	24.2% (n = 327)
Mental Health (Child)	14.0% (n = 399)	33.8% (n = 951)	55.6% (n = 1,420)	61.2% (n = 826)
Mental Health (Parent)	53.1% (n = 1,509)	49.9% (n = 1,407)	42.1% (n = 1,076)	35.5% (n = 479)
Substance Abuse (Child)	NA	NA	3.4% (n = 86)	12.5% (n = 169)
Substance Abuse (Parent)	24.9% (n = 708)	28.7% (n = 809)	30.9% (n = 790)	29.1% (n = 393)
Child Abuse and Neglect	8.4% (n = 239)	10.6% (n = 300)	13.2% (n = 337)	9.6% (n = 129)
Potential Language Barrier	5.1% (n = 146)	6.3% (n = 177)	7.9% (n = 203)	7.3% (n = 99)
Parental Disability	5.8% (n = 164)	5.4% (n = 153)	6.4% (n = 163)	8.9% (n = 120)

Note: Due to reporting rules from ICS, populations with low counts (n ≤ 10) are masked and reported as NA. For **24%** of children in the statewide dataset, it was not possible to link the child to either parent. Therefore, these children only have data available for the five child-level social complexity indicators.

Appendix continued: Medical, Social, and Health Complexity by Age Group

Number of social complexity indicators by age group

Cascade Health Alliance



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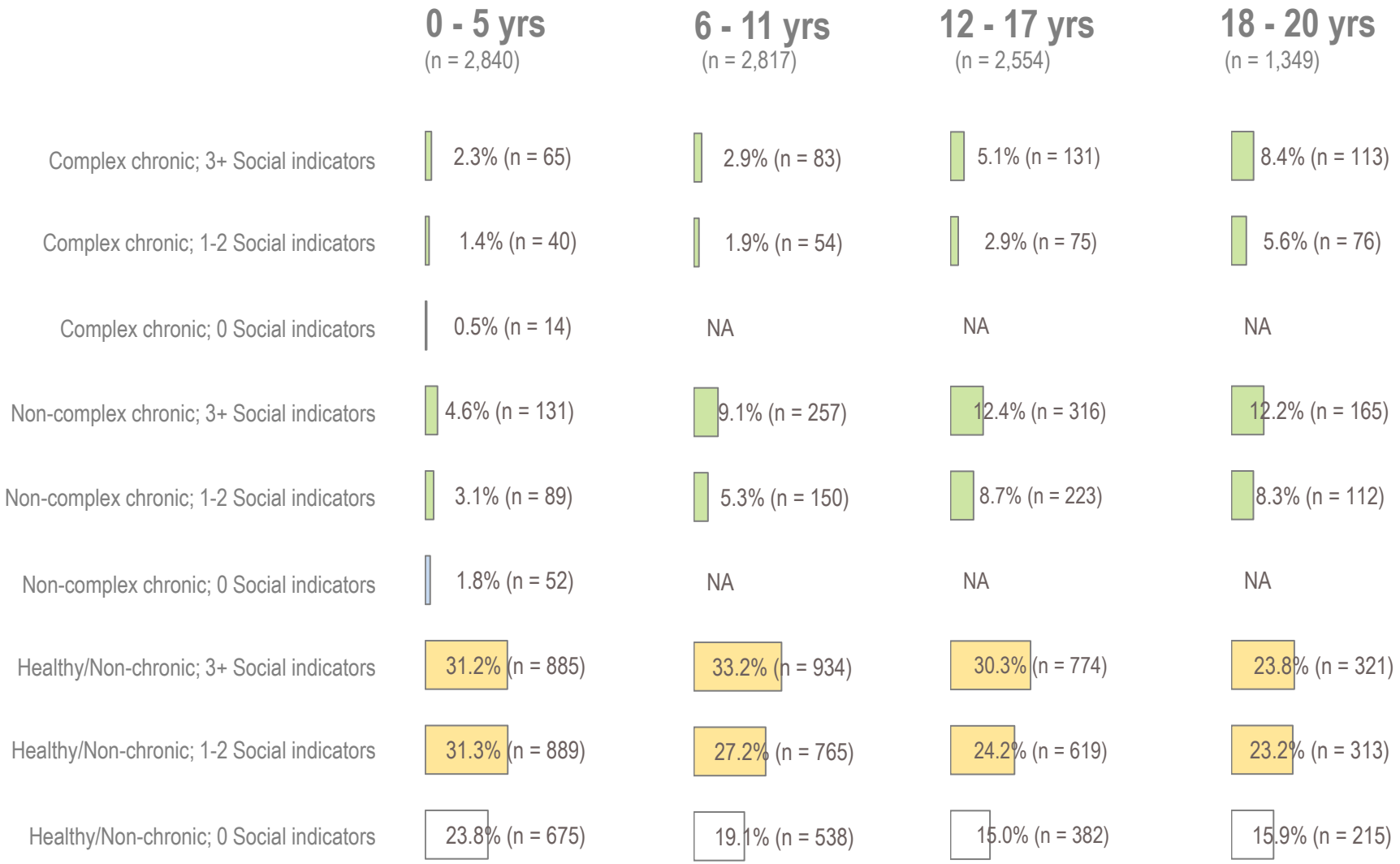
Health complexity by age group

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