Health Complexity in Children – Statewide Summary Report

November 2018

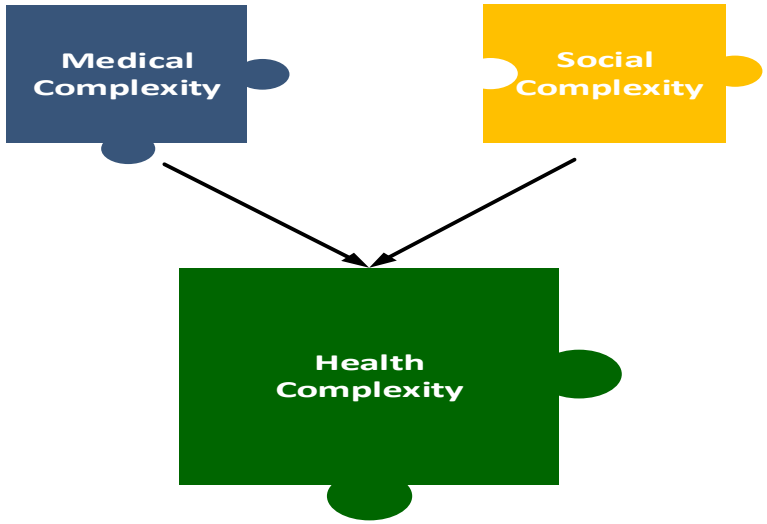
Introduction

The goal of this exploratory project is to identify children with health complexity in the Medicaid population and share this information with CCOs and other partners. Health complexity is based on medical complexity and social complexity. This dataset includes 390,582 publicly insured children that were eligible for Medicaid at the time of the data pull.

This project is a partnership between:

1) Oregon Pediatric Improvement Partnership (OPIP)
2) Oregon Health Authority (OHA) - Health Analytics Department
3) Department of Human Services (DHS) – Oregon Enterprise Data Analytics (OEDA) and Integrated Client Services (ICS)

Additional support for OPIP's role in providing technical consultation and facilitation of public and private stakeholders was provided by the Lucile Packard Foundation for Children's Health.



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Data sources for this dataset include:

1. 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

2. Medicaid data sourced from the Medicaid Management Information System (MMIS).

Medical Complexity

Background

To measure medical complexity, we are using the Pediatric Medical Complexity Algorithm (PMCA). The PMCA 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). The PMCA was run using three years of data and using the most conservative version of the algorithm. The target period was July 2015 to June 2016 with claims data pulled one year before this target year and one year after the target year for a three-year total period.

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.seattlechildrens.org/research/centers-programs/child-health-behavior-and-development/labs/mangione-smith-lab/measurement-tools/

Summary of Data and Key Findings

This dataset includes 390,582 publicly insured children that were eligible for Medicaid at the time of the data pull.

Statewide:

- 6.1% of children were placed into the complex chronic disease category
- 18.3% of children were placed into the non-complex chronic disease
- 75.6% of children were placed into the no chronic disease or healthy category

Almost a quarter of children (24.4%) had some level of medical complexity.

Looking at the medical complexity categories by CCO and Open Card there is low variability among the CCOs/Open Card.

- The range for complex chronic is between 5.8% to 6.4% of children.
- The range for non-complex chronic disease is between 17.6% to 19.1% of children.
- The range for no chronic disease or healthy is between 74.8% to 76.2% of children.

There is not a statistically significant difference between the medical complexity categories across CCOs/Open Card in this dataset.

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 social complexity factors associated with worse health outcomes and increased costs.

OPIP, OHA and DHS went through an extensive process to identify useable data sources for these social complexity factors using Health Analytics and Integrated Client Data Warehouse (ICS) data. After this process we were left with 12 factors of social complexity that could be identified for this population during this first phase of work. The lookback period for these data is the lifetime of the child plus one year before their birth. There are **5 child-level factors** and **7 parent/family level factors** for a total of 12 factors. For about 20% of children in this dataset, it was not possible to link the child to either parent. Therefore, these children only have data available for the 5 **child-level** social complexity factors.

Social Complexity Factors	Child-Level Factor	Parent/Family – Level Factor	Total
Poverty – Child received Temporary Assistance for Needy Families (TANF)	x		x
Foster Care – Child receiving foster care services DHS OR Kids since 2012	x		x
Mental Health – Child received mental health services through DHS/OHA	x		x
Substance Abuse – Child received substance abuse treatment through DHS/OHA	x		x
Child Abuse or Neglect – Captured by ICD-9 and ICD-10 diagnosis codes related to service	x		x
Poverty – Parent received Temporary Assistance for Needy Families (TANF)		x	x
Parental Death – Death of parent/primary caregiver in Oregon		x	x
Parental Incarceration – Parent incarcerated or supervised by the Department of Corrections in Oregon (primarily felony level crimes, excludes city-county jail)		x	x
Mental Health – Parent received mental health services through DHS/OHA		x	x
Substance Abuse – Parent received substance abuse treatment through DHS/OHA		x	x
Limited English Proficiency – Language other than English listed in primary language field		x	x
Parental Disability – OHA disability due to parent disability		x	x
Total Factors	5	7	12

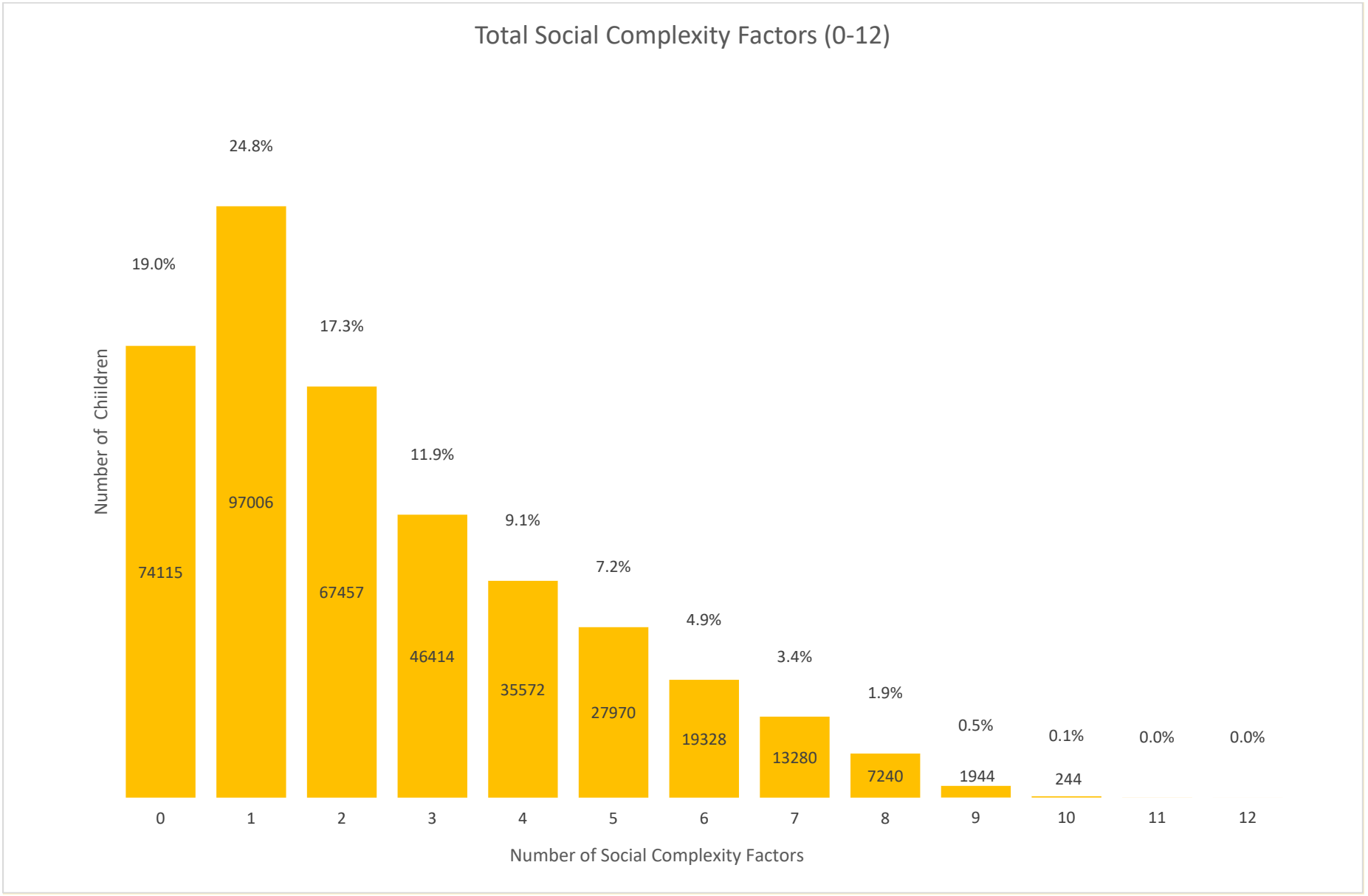
Summary of Data and Key Findings

There was an average of 2.41 social complexity factors per child across the population. In other words, the average child had 2.41 social complexity factors. This did not vary significantly by CCO/Open Card. There was a range of 2.38 to 2.46 social complexity factors per child.

The table below shows the percent and the number of children with that social complexity factor. For example, 13% of children or 50,672 received foster care services in this dataset. Data for each child includes the lifetime of the child plus one year before their birth.

In the future, state partners will operationalize a regular cycle for release of this data. Additional analyses and technical activities are anticipated.

Social Complexity Factor	Child-Level Factor	Parent/Family – Level Factor
Child Abuse or Neglect – Captured by ICD-9 and ICD-10 diagnosis codes related to service	5.3% (20,589)	
Foster Care – Child receiving foster care services DHS OR Kids since 2012	13.0% (50,672)	
Mental Health – Child received mental health services through DHS/OHA	33.1% (129,212)	
Poverty – Child received Temporary Assistance for Needy Families (TANF)	40.6% (158,650)	
Substance Abuse – Child received substance abuse treatment through DHS/OHA	4.5% (17,763)	
Limited English Proficiency – Language other than English listed in primary language field		20.5% (80,262)
Mental Health – Parent received mental health services through DHS/OHA		40.0% (156,221)
Parental Death – Death of parent/primary caregiver in Oregon		1.3% (5,172)
Parental Disability – OHA disability due to parent disability		3.0% (11,892)
Parental Incarceration – Parent incarcerated or supervised by the Department of Corrections in Oregon (primarily felony level crimes, excludes city-county jail)		19.1% (74,707)
Poverty – Parent received Temporary Assistance for Needy Families (TANF)		31.2% (121,952)
Substance Abuse – Parent received substance abuse treatment through DHS/OHA		29.0% (113,124)



For example, 11.9% of children or 46,414 children had 3 social complexity factors.

Overall, 38.8% of children (n = 152,004) had 3 or more social complexity factors.

Health Complexity

Background

Medical complexity and social complexity are then 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 is very different then 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 variable: Children with 3 or more social risk factors, children with 1-2 risk factors, and children with no social risk factors. These categories were chosen because children with 1 or more social risk factors 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.

Summary of Data and Key Findings

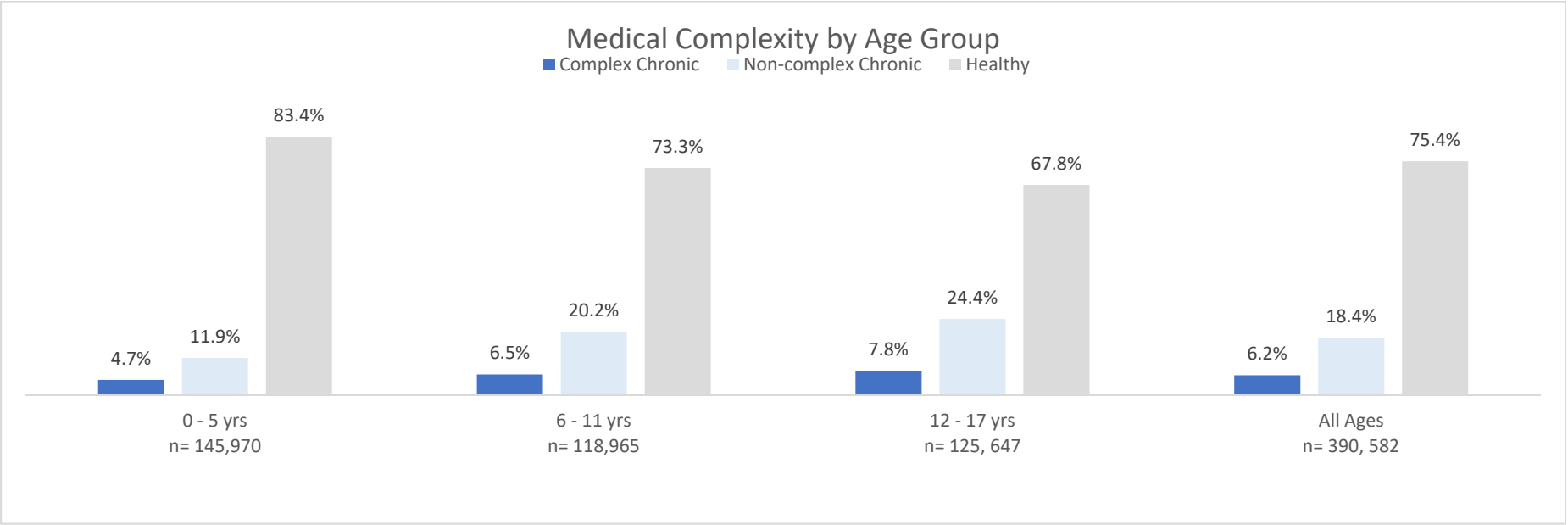
The nine boxes are the components of the nine-part categorical variable for health complexity

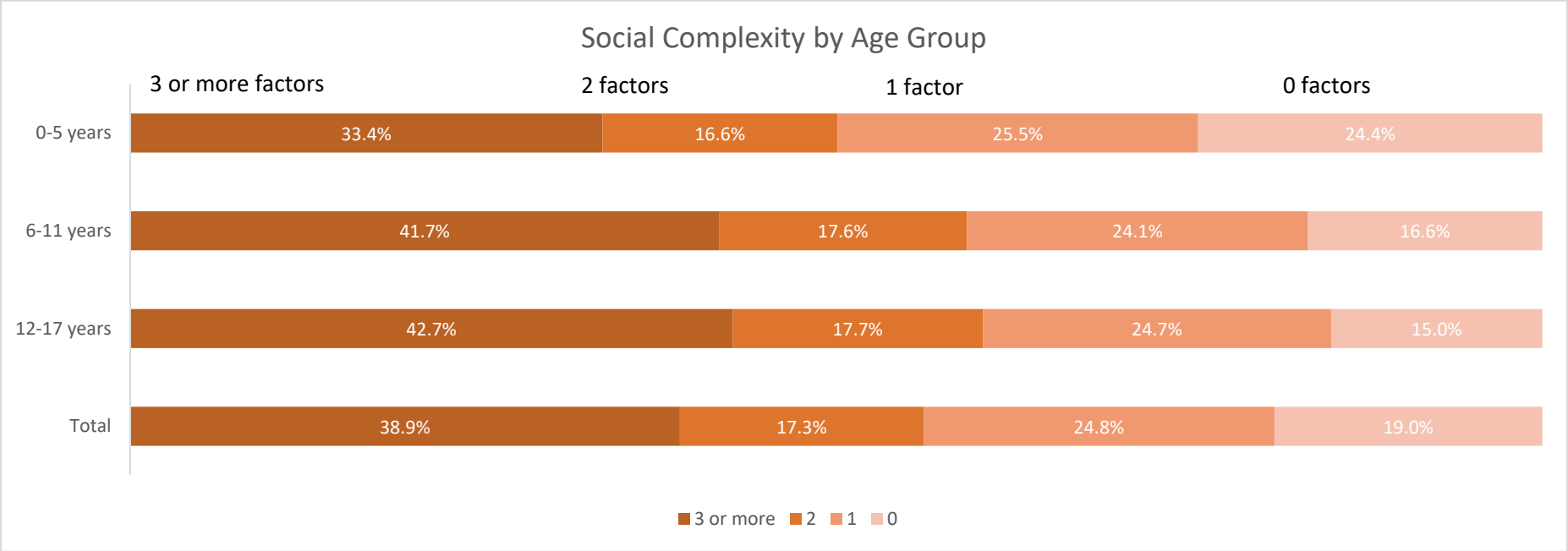
1. Healthy / 0 social factors
2. Healthy / 1-2 social factors
3. Healthy / 3+ social factors
4. Non-complex chronic / 0 social factors
5. Non-complex chronic / 1-2 social factors
6. Non-complex chronic / 3+ social factors
7. Complex chronic / 0 social factors
8. Complex chronic / 1-2 social factors
9. Complex chronic / 3+ social factors

Medical COMPLEXITY (3 Categories)	**SOCIAL COMPLEXITY (12 Factors Total)**		
	3 or More Factors	**1-2 Factors**	**None in System-Level Data**
Complex Chronic	**9** 3.0% (11,637)	**8** 2.4% (9,342)	**7** 0.7% (2,702)
Non – Complex Chronic	**6** 9.5% (36,908)	**5** 7.2% (27,952)	**4** 1.7% (6,731)
Non – Chronic / Healthy	**3** 26.5% (103,459)	**2** 32.6% (127,169)	**1** 16.6% (64,682)

For example, 3.0% of children or 11,637 children were in the complex chronic category AND had 3 or more social complexity factors.

APPENDIX 1: COMPLEXITY BY AGE GROUP

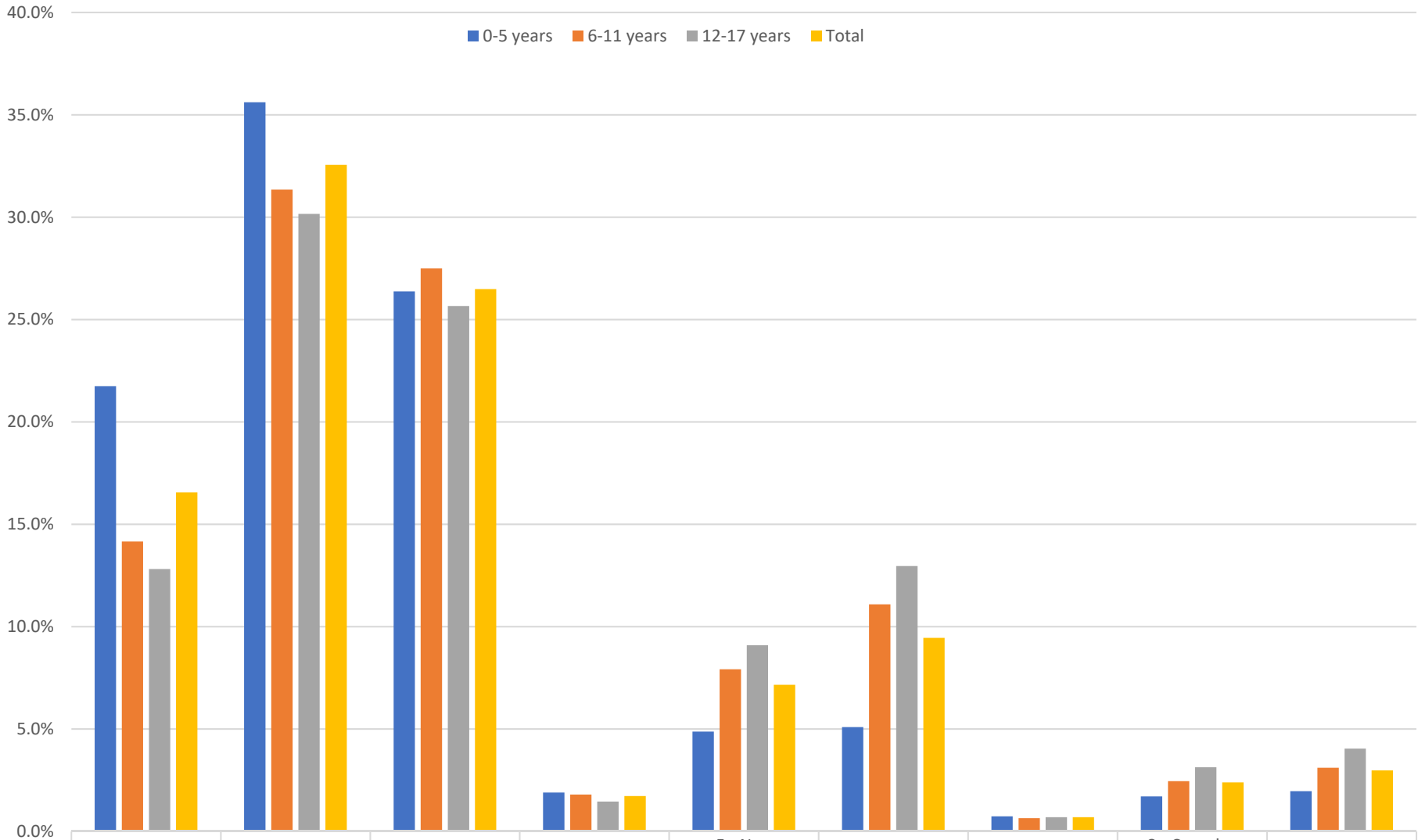




Social Complexity Factor Prevalence by Age Group

	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% 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% 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**

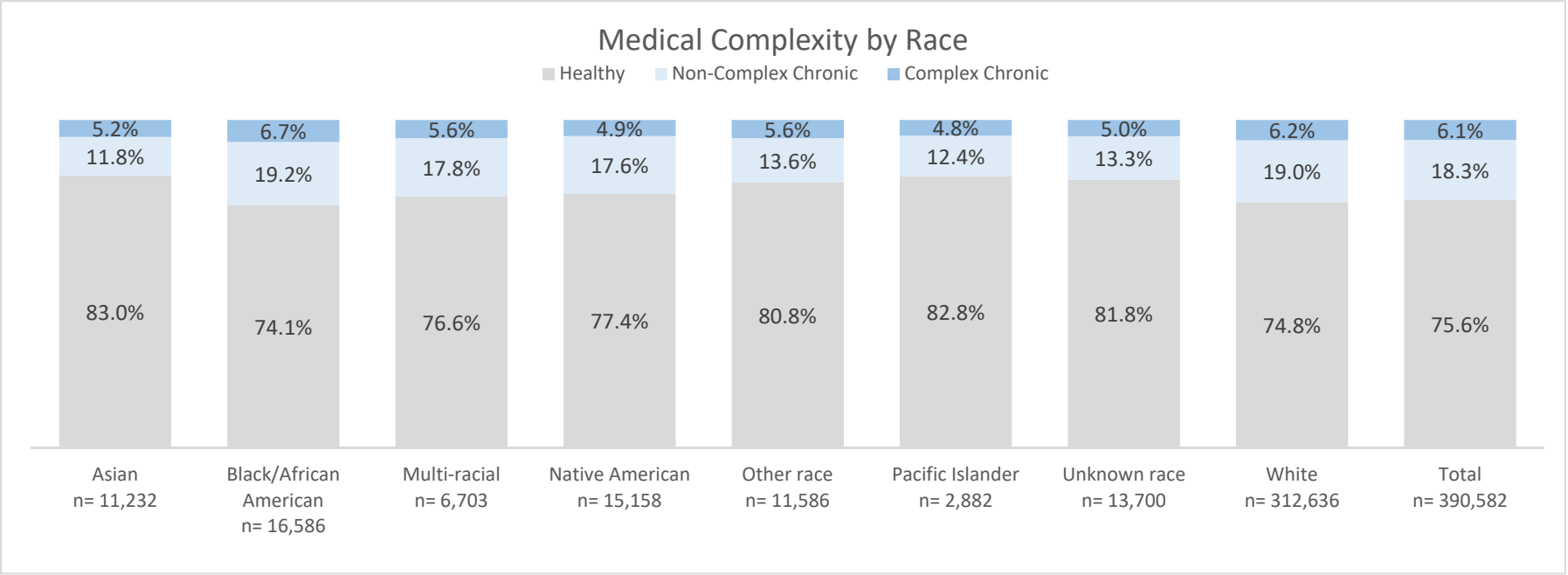
Nine Categories of Health Complexity by Age Group

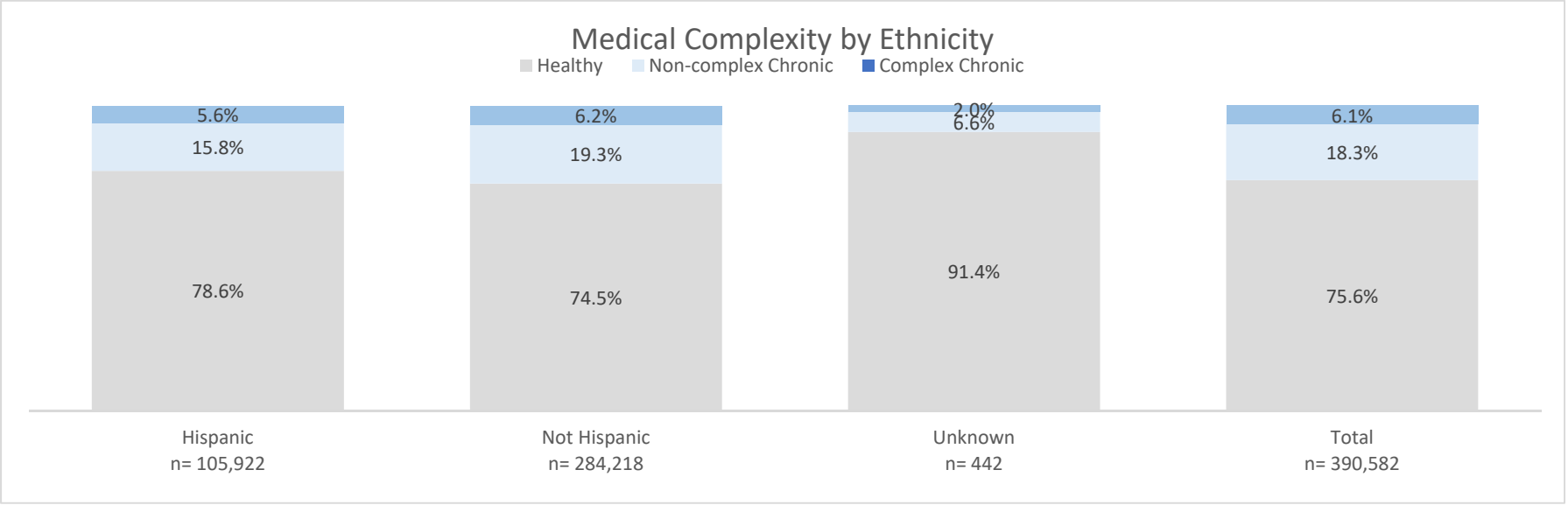


	1 - Healthy/ 0 social	2 - Healthy/ 1-2 social	3 - Healthy/3+ social	4 - Non complex/0 social	5 - Non complex/1-2 social	6 - Non complex/ 3+ social	7 - Complex chronic / 0 social	8 - Complex chronic / 1-2 social	9 - Complex chronic/ 3+ social
0-5 years	21.7%	35.6%	26.4%	1.9%	4.9%	5.1%	0.7%	1.7%	2.0%
6-11 years	14.2%	31.3%	27.5%	1.8%	7.9%	11.1%	0.6%	2.5%	3.1%
12-17 years	12.8%	30.2%	25.7%	1.5%	9.1%	13.0%	0.7%	3.1%	4.0%
Total	16.6%	32.6%	26.5%	1.7%	7.2%	9.4%	0.7%	2.4%	3.0%

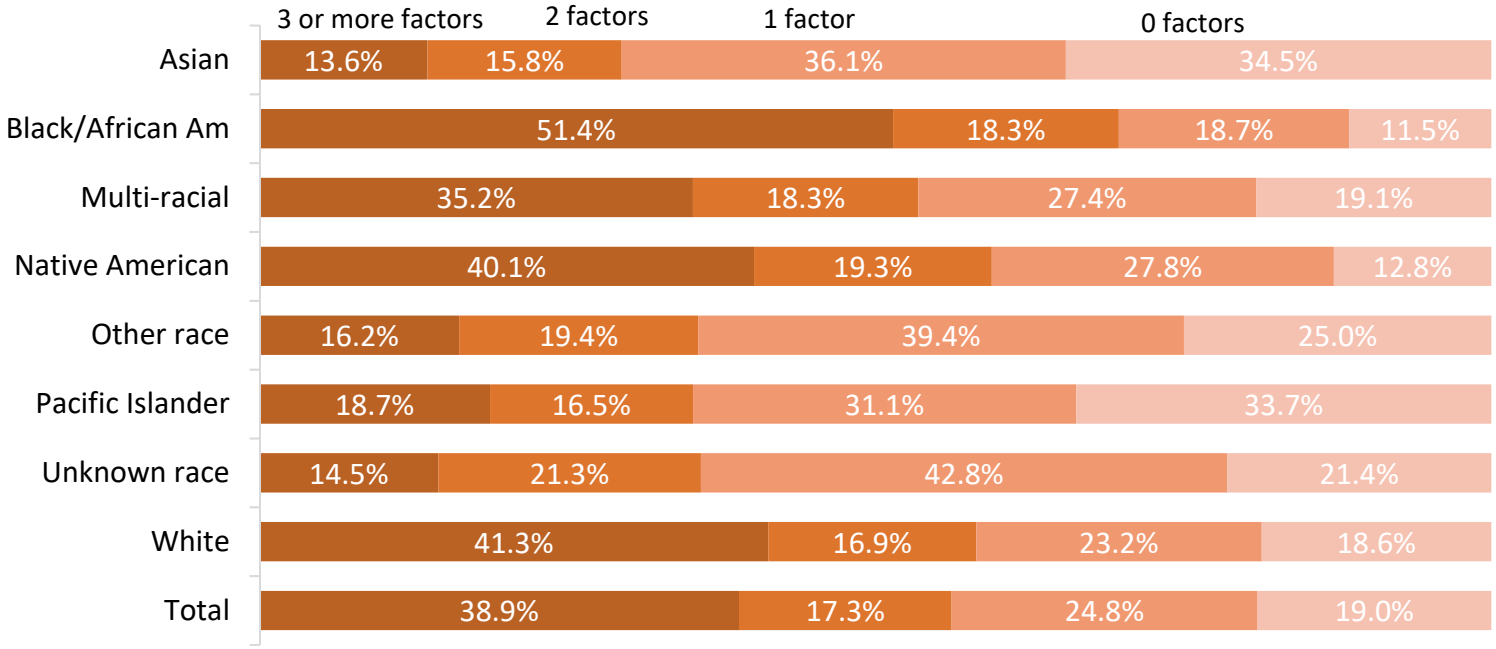
APPENDIX 2: COMPLEXITY BY RACE AND ETHNICITY OF CHILD

Note: Race and Ethnicity data used in this report are sourced from multiple agency data sources in ICS data warehouse.

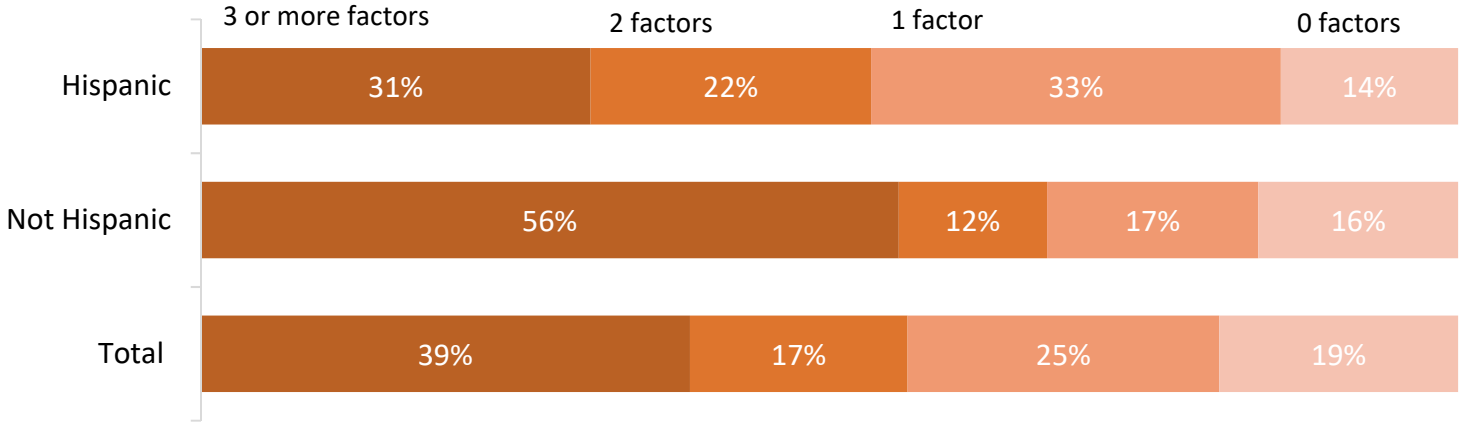




Social Complexity Factors by Race



Social Complexity Factors by Ethnicity



Social Complexity Factor Prevalence by Race

	Asian		Black/African American		Native American		White	
	N=11,232		N=16,586		N=15,158		N= 312,636	
	Child Factor	Parent Factor	Child Factor	Parent Factor	Child Factor	Parent Factor	Child Factor	Parent Factor
Poverty –TANF (For Child and For Either/Both Parent)	22.6% 2,543	12.8% 1,433	70.3% 11,666	50.7% 8,409	40.3% 6,113	29.5% 4,466	41.5% 129,733	33.0% 103,282
Foster care – Child receiving foster care services DHS ORKids	3.4% 385		18.2% 3,015		15.0% 2,270		14.0% 43,767	
Parent death – Death of parent/primary caregiver in OR		0.8% 88		1.5% 253		1.6% 247		1.4% 4,374
Parental incarceration – Parent incarcerated or supervised by the Dept. of Corrections in Oregon.		5.9% 661		24.1% 3,998		20.1% 3,053		20.5% 63,960
Mental Health: Child – Received mental health services through DHS/OHA	16.0% 1,795		34.1% 5,659		32.5% 4,920		34.8% 108,947	
Mental Health: Parent – Received mental health services through DHS/OHA		13.9% 1,564		42.3% 7,018		36.3% 5,504		43.5% 136,040
Substance Abuse: Child – Substance abuse treatment through DHS/OHA	1.1% 129		6.2% 1,024		5.2% 783		4.9% 15.210	
Substance Abuse: Parent – Substance abuse treatment through DHS/OHA		7.5% 840		29.5% 4,892		34.1% 5,170		31.2% 97,411
Child abuse/neglect: ICD-9, ICD-10 dx codes related to service	2.0% 224		7.1% 1,185		5.5% 834		5.6% 17,537	
Limited English Proficiency: Language other than English listed in the primary language field		34.3% 3,855		10.6% 1,755		33.0% 5,003		17.2% 53,657
Parent Disability: OHA eligibility due to parent disability		1.4% 161		6.5% 1,071		2.5% 375		3.2% 10,021

Social Complexity Factor Prevalence by Race

	Hispanic N = 105,922		Not Hispanic N= 284,218	
	Child Factor	Parent Factor	Child Factor	Parent Factor
Poverty –TANF (For Child and For Either/Both Parent)	**37.2% 39,392**	**21.5% 22,811**	**42.0% 119,250**	**34.9% 99,138**
Foster care – Child receiving foster care services DHS ORKids	**7.8% 8,245**		**14.9% 42,424**	
Parent death – Death of parent/primary caregiver in OR		**0.6% 677**		**1.6% 4,495**
Parental incarceration – Parent incarcerated or supervised by the Dept. of Corrections in Oregon.		**13.0% 13,734**		**21.4% 60,959**
Mental Health: Child – Received mental health services through DHS/OHA	**27.2% 28,838**		**35.3% 100,345**	
Mental Health: Parent – Received mental health services through DHS/OHA		**25.9% 27,400**		**45.3% 128,796**
Substance Abuse: Child – Substance abuse treatment through DHS/OHA	**2.9% 3,046**	**19.9% 21,091**	**5.2% 14,717**	
Substance Abuse: Parent – Substance abuse treatment through DHS/OHA				**32.4% 92,001**
Child abuse/neglect: ICD-9, ICD-10 dx codes related to service	**3.7% 3,868**		**5.9% 16,720**	
Limited English Proficiency: Language other than English listed in the primary language field		**47.2% 49,956**		**10.7% 30,288**
Parent Disability: OHA eligibility due to parent disability		**1.2% 1,282**		**3.7% 10,610**

Health Complexity by Race

Health Complexity	Asian	Black/African American	Multi-racial	Native American	Other race	Pacific Islander	Unknown race	White	Total
1 - Healthy/ 0 social	30.6%	9.8%	16.6%	11.1%	22.1%	29.8%	19.2%	16.2%	16.6%
2 - Healthy/ 1-2 social	42.0%	28.8%	35.7%	37.2%	47.5%	39.3%	52.3%	30.6%	32.6%
3 - Healthy/ 3+ social	10.4%	35.5%	24.4%	29.2%	11.3%	13.7%	10.3%	27.9%	26.5%
4 - Non complex/0 social	2.8%	1.3%	1.9%	1.3%	2.1%	2.8%	1.6%	1.7%	1.7%
5 - Non complex/1-2 social	6.7%	6.1%	7.5%	7.9%	7.9%	5.9%	8.6%	7.1%	7.2%
6 - Non complex/ 3+ social	2.3%	11.9%	8.3%	8.4%	3.6%	3.7%	3.1%	10.2%	9.4%
7 - Complex chronic / 0 social	1.2%	0.5%	0.6%	0.4%	0.8%	1.1%	0.6%	0.7%	0.7%
8 - Complex chronic / 1-2 social	3.1%	2.2%	2.5%	2.0%	3.5%	2.4%	3.2%	2.3%	2.4%
9 - Complex chronic/ 3+ social	0.9%	4.0%	2.5%	2.5%	1.3%	1.3%	1.1%	3.2%	3.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Health Complexity by Ethnicity

Health Complexity	Hispanic	Not Hispanic	Unknown	Total
1 - Healthy/ 0 social	12.3%	18.1%	71.0%	16.6%
2 - Healthy/ 1-2 social	44.3%	28.2%	19.7%	32.6%
3 - Healthy/ 3+ social	22.1%	28.2%	0.7%	26.5%
4 - Non complex/0 social	1.4%	1.9%	3.4%	1.7%
5 - Non complex/1-2 social	7.8%	6.9%	2.9%	7.2%
6 - Non complex/ 3+ social	6.6%	10.5%	0.2%	9.4%
7 - Complex chronic / 0 social	0.5%	0.8%	1.1%	0.7%
8 - Complex chronic / 1-2 social	2.8%	2.2%	0.9%	2.4%
9 - Complex chronic/ 3+ social	2.3%	3.2%	0.0%	3.0%
Total	100.0%	100.0%	100.0%	100.0%

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