A stylized map of Virginia is shown in a light blue color, filled with a pattern of small human icons representing men and women. The map is positioned on the right side of the page, partially overlapping the text boxes.

Behavioral

Health in Virginia

**Alignment, Accountability,
and Access** MARCH 2018



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Background

Across the country, state governments and agencies are examining how their public resources and health care systems meet and miss the needs of their populations. Integration of behavioral health across health and healthcare systems is among the highest priorities when addressing comprehensive health of populations. The Commonwealth of Virginia is deeply committed to improving behavioral health in the state and is actively exploring opportunities and best practices to meet the people's needs.

The Farley Health Policy Center (FHPC) strives to advance policy that overcomes fragmented systems and addresses the wholeness of a person – physical, behavioral, and social health in the context of family, community, and the healthcare system. The FHPC works with state agencies and policymakers to understand achievable policy actions to improve the integration of behavioral health across health and healthcare systems. With support from the Robert Wood Johnson Foundation, the FHPC partnered with the Virginia Department of Medical Assistance Services (DMAS) to learn about Virginia's needs, strengths, and opportunities to advance the integration of behavioral health. DMAS facilitated engagement with two other state agencies, Department of Behavioral Health and Developmental Services (DBHDS) and the Department of Health (VDH) as well as other policy leaders, philanthropic organizations, non-profit associations, and workgroups focused on behavioral health across the Commonwealth. This report presents findings from the compilation of behavioral health data received from three state agencies (DMAS, DBHDS, and VDH) and initial recommendations to advance behavioral health integration in the Commonwealth.

Introduction

National and State Context of Behavioral Health

In 2015, more than 43 million Americans experienced a mental health issue, 20.8 million a substance use disorder, and 8.1 million experienced both (approximately 14%, 6.5%, and 2.5%, respectively).¹ Within the healthcare delivery system in 2014, there were 65.9 million visits to physician offices and 5 million emergency department visits with a primary diagnosis of a mental health disorder.^{2,3} Additionally, there has been a staggering increase in the age-adjusted rate of suicide, up 24% from 1999 to 2014.⁴

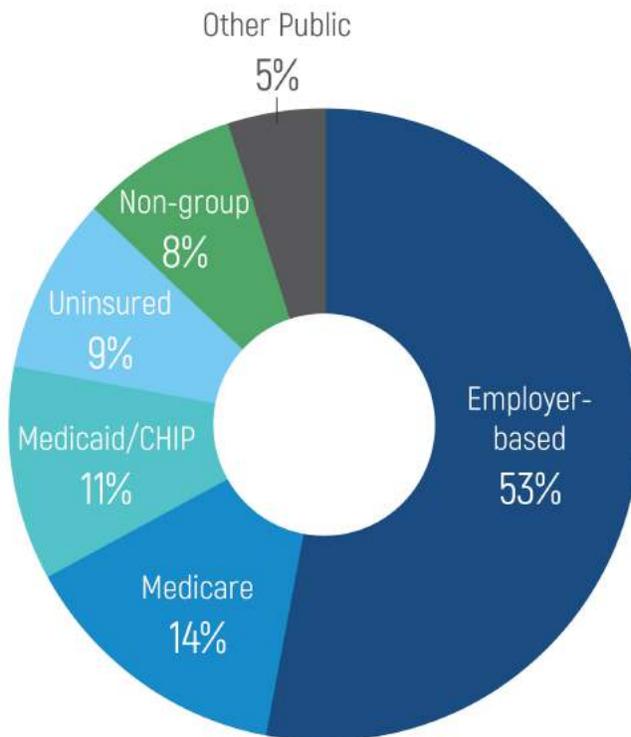
At the state-level, 19.2% of Virginians experienced a mental health issue which is slightly higher than the national prevalence of 18%.⁵ For substance use, 7.7% of Virginia's adult population reported substance use dependence or abuse which is slightly less than the national prevalence in 2015-16.⁶ Twenty-nine percent of adult Virginians reported having poor mental health status. Twenty-eight percent of Virginia's population is low-income, a well-documented risk factor for behavioral health issues and a barrier for healthcare access.⁷

Insurance coverage is a critical marker for access to behavioral healthcare. Figure 1 shows the distribution of health insurance coverage in Virginia in 2015: 53% of the state was covered by employer-based insurance; 11% Medicaid; 14% Medicare; 9% uninsured; 8% non-group, and 5% other public insurance. Medicaid/CHIP enrollment has increased in Virginia since the



implementation of the Patient Protection and Affordable Care Act (ACA). From 2013 to 2015, the uninsured rate for Virginia has decreased from 12% to 9%, corresponding with the ACA implementation.⁷

Figure 1. Health Insurance Trends in Virginia



Medicaid: State of Behavioral Health in Virginia

Medicaid plays a critical role in the integration of behavioral health as the single largest payer in the United State for behavioral health services, including mental health and substance use services. In 2014, Medicaid accounted for 25% of mental health spending and 21% of substance use disorder spending for the U.S.⁸ Medicaid enrollees with behavioral health diagnoses have a spectrum of healthcare needs, including treatment for comorbid physical and behavioral health issues. While only one in five Medicaid beneficiaries had behavioral health diagnoses in 2011, those with comorbidities of physical and behavioral health conditions accounted for almost half of all Medicaid expenditures, with more than \$131 billion spent on their Medicaid-covered services.⁹

In fiscal year 2017, 1.01 million Virginians were enrolled in Medicaid (12% of the total state population estimate for 2016).¹⁰ Medicaid spending was \$9.37 billion, with an average annual cost per monthly enrollee of \$8,597. Table 1 shows an increase in enrollment and cost from fiscal years 2016 to 2017. The Kaiser Family Foundation reports 22% of the state general fund spending in Virginia goes to Medicaid and 42% of all federal funds received by Virginia is for



Medicaid. Additionally, 83% of Medicaid beneficiaries in Virginia are in managed care plans. Similar to national trends, a large majority of Virginia Medicaid beneficiaries are low-income children and families (roughly 72%), but most of the spending was for the elderly and people with disabilities (66%). One in six dollars spent overall in the healthcare system goes to Medicaid.

Table 1. Virginia Medicaid and CHIP enrollment numbers and total expenditures, 2016-2017

	Medicaid	Medicaid/CHIP
No. (%) Enrolled - FY 2016	991,112 (11.8%)	1.099 million (13.1%)
No. (%) Enrolled - FY 2017	1.011 million (12.0%)	1.125 million (13.4%)
Total Expenditures - FY 2016	\$8.86 billion	\$9.11 billion
Total Expenditures - FY 2017	\$9.37 billion	\$9.67 billion

Twenty-eight percent of Medicaid recipients (386,305) had either primary or secondary behavioral health diagnoses. Figure 2 displays the distribution of types of behavioral health diagnoses: mental illness (MI); serious mental illness (SMI; defined as either bipolar or schizophrenia and other psychotic disorders); substance use disorders (SUD); and intellectual and developmental disorders (IDD). Data in the figure represent the number and percentage of Medicaid recipients with behavioral health diagnoses and a paid medical service claim (hereafter referred to as Medicaid recipients with behavioral health diagnoses). These recipients can be diagnosed with more than one behavioral health condition.

Figure 2. Number and Percentage of Total Medicaid Recipients with Behavioral Health Diagnoses.





Outcomes

The Virginia Department of Health regionalizes the state into five distinct regions: Central, Eastern, Northern, Northwest, and Southwest regions. Deaths rate and adverse behavioral health outcomes were tabulated at the state and regional level in Table 2 for the following outcomes: suicide rate per 100,000 population, overdose rate per 100,000, percentage of adults reporting poor mental health status, and percentage of adults reporting binge drinking.

Table 2. Select Behavioral Health Outcomes by Geography

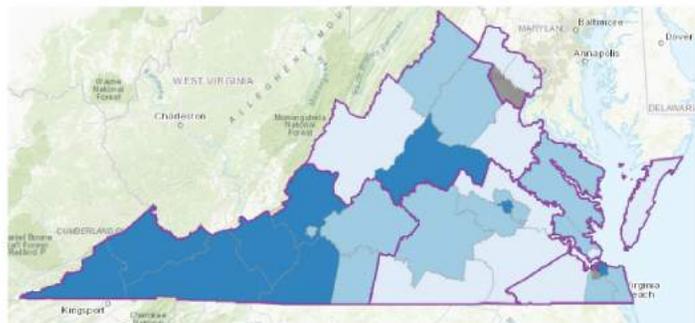
Geography	Suicide Rate*	Overdose Rate*	Poor MH Status, 2015	Binge Drinking, 2015
Virginia	12.2	9.1	30.2%	16.2%
Central Region	12.6	9	28.7%	17.1%
Eastern Region	11.8	9.1	29.5%	17.4%
Northern Region	8.6	5.2	28.2%	19.9%
Northwest Region	13.9	9.4	30.0%	15.5%
Southwest Region	16.8	15.2	33.2%	15.7%

*per 100,000; 10-year average; 2004-2015

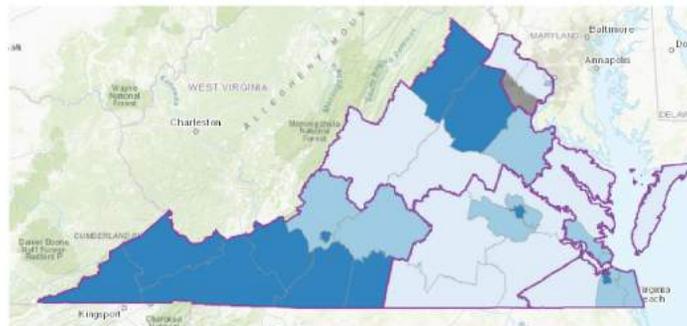
The following maps represent smaller geographic areas, the VDH designated Local Health Districts (LHDs). Figures 4 show the patterns for each of the behavioral health outcomes presented above. Adults reporting poor mental health, overdose death rate per 100,000 and suicide rate per 100,000 exhibit higher proportions in the Southwest region of the state. The Central region also has moderate to high proportions of these indicators. The Northern region exhibits higher rates of death due to overdose and suicide. The percentage of adults reporting binge drinking has a varying distribution compared to the other indicators, mostly due to the greater number of unavailable reporting.



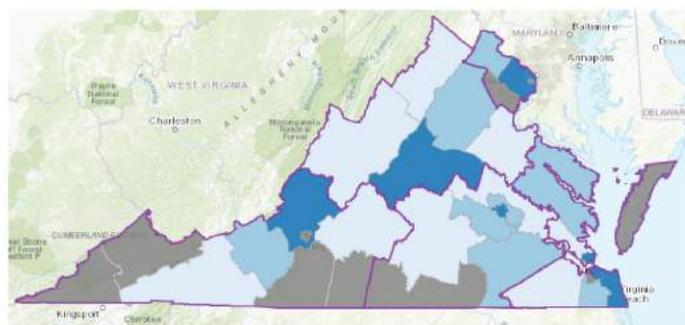
Figure 4. Maps of Select Population Behavioral Health Outcomes by Local Health District, Virginia Department of Health



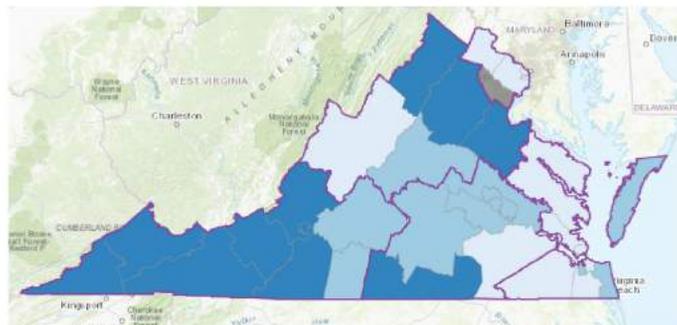
% of Adults Reporting Poor Mental Health, LHD - 2015



Overdose Death Rate per 100,000, LHD - 2015



% of Adults Reporting Binge Drinking, LHD - 2015



Suicide Rate per 100,000, LHD - 2015





Need

This section outlines the behavioral health needs of the Virginia Medicaid population. With data provided from DMAS, the following tables and figures display the variation of diagnoses and population density among Medicaid recipients with behavioral health diagnoses by geography and age. Understanding geographic and age variations allows stakeholders to determine where services are needed and to whom services should be directed. Table and figures include Medicaid recipients with behavioral health diagnoses and a paid medical service claim in fiscal year 2017 (hereafter referred to as Medicaid recipients with behavioral health diagnoses).

Table 3. Percentage of Medicaid Recipients with Behavioral Health Diagnoses by Geography

	Total BH	MI	SMI	SUD	IDD
Virginia	28.1	22.0	12.0	3.9	5.2
Central Region	29.1	22.3	12.7	4.3	5.3
Eastern Region	28.5	21.9	11.1	3.2	5.2
Hampton Roads Region	27.6	21.6	11.7	3.6	5.3
Northern Region	18.9	14.2	6.7	2.2	4.3
Southside Region	32.2	25.8	13.6	4.2	5.7
Southwest Region	38.5	31.4	17.9	6.5	5.6
Valley Region	30.7	24.4	13.6	4.0	5.7
West Central Region	34.9	27.7	16.4	5.5	6.0

Figure 5: Percentage of Medicaid Recipients with Behavioral Health Diagnoses by Age

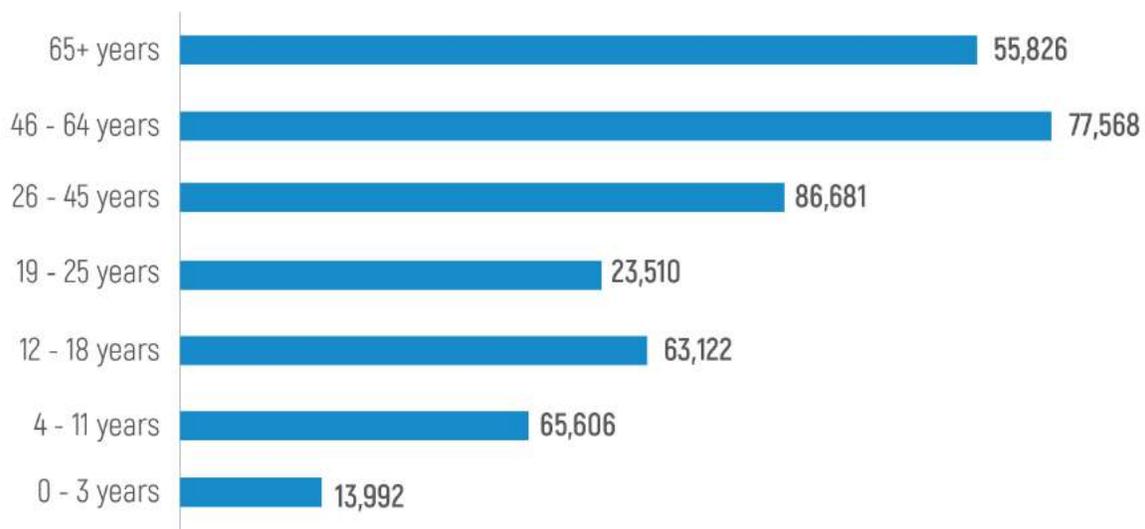




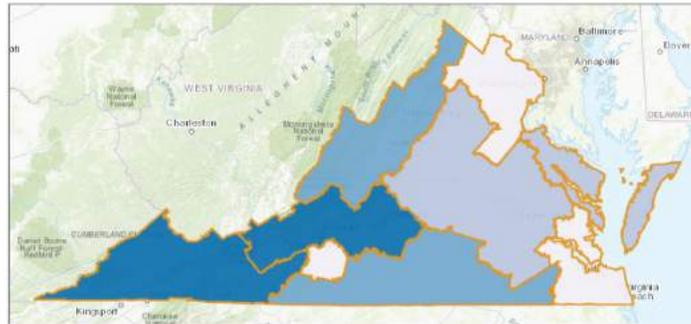
Figure 6a and 6b. Percentage of Medicaid Recipients with Behavioral Health Diagnoses- HIPAA area and Region

LEGEND

○ DMAS Regions

% of Medicaid Recipients Behavioral Health Diagnosis – Regions

- > 32.1 – 38.4
- > 29.1 – 32.1
- > 27.6 – 29.1
- 18.8 – 27.6

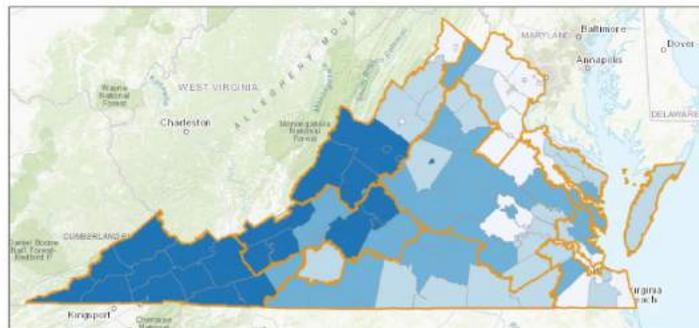


LEGEND

○ DMAS Regions

% of Medicaid Recipients Behavioral Health Diagnosis – HIPAA Area

- > 35 – 43
- > 31.3 – 34.9
- > 28 – 31.3
- 15.9 – 27.9



Aggregating to HIPAA area (to protect confidentiality) and region in Figures 6a and 6b indicates that the proportion of Medicaid recipients with behavioral health diagnoses are concentrated in the southwest region of the state. However, examining HIPAA areas, the northwest region has a gradient distribution in behavioral diagnoses with less than 28% in the top corner and greater than 35% in the lower corner. This pattern demonstrates the need to look at additional factors that may contribute to differences within a singular geography when assessing trends because regional-level may not be sufficient in diverse areas.



Table 4. Distribution of Medicaid Recipients with Behavioral Health Diagnoses by Age and Delivery Model

*Limited= limited coverage; CCC = Commonwealth Coordinated Care; PACE= Program All-Inclusive Care for the Elderly

	Managed Care			FFS			Limited			CCC			PACE		
	Total Medicaid Pop.	BH Pop.	%	Total Medicaid Pop.	BH Pop.	%	Total Medicaid Pop.	BH Pop.	%	Total Medicaid Pop.	BH Pop.	%	Total Medicaid Pop.	BH Pop.	%
Total	1,726,529	430,564	24.9%	454,744	204,732	45.0%	505,496	87,333	17.3%	65,347	38,677	59.2%	1,594	417	26.2%
0 to 3	344,014	27,023	7.9%	42,810	3,673	8.6%	269	130	48.3%	-	-	-	-	-	-
4 to 11	587,954	117,698	20.0%	71,140	15,044	21.1%	1,600	1,066	66.6%	-	-	-	-	-	-
12 to 18	391,917	101,226	25.8%	58,647	17,164	29.3%	1,200	720	60.0%	-	-	-	-	-	-
19 to 25	78,540	27,873	35.5%	27,897	10,927	39.2%	97,616	8,816	9.0%	1,883	1,103	58.6%	-	-	-
26 to 45	218,733	94,314	43.1%	65,255	34,888	53.5%	203,881	32,250	15.8%	12,440	7,953	63.9%	-	-	-
46 to 64	93,585	57,547	61.5%	67,081	49,333	73.5%	131,080	31,688	24.2%	18,623	12,407	66.6%	215	63	29.3%
65 & over	11,786	4,883	41.4%	121,914	73,703	60.5%	69,850	12,663	18.1%	32,401	17,214	53.1%	1,379	354	25.7%

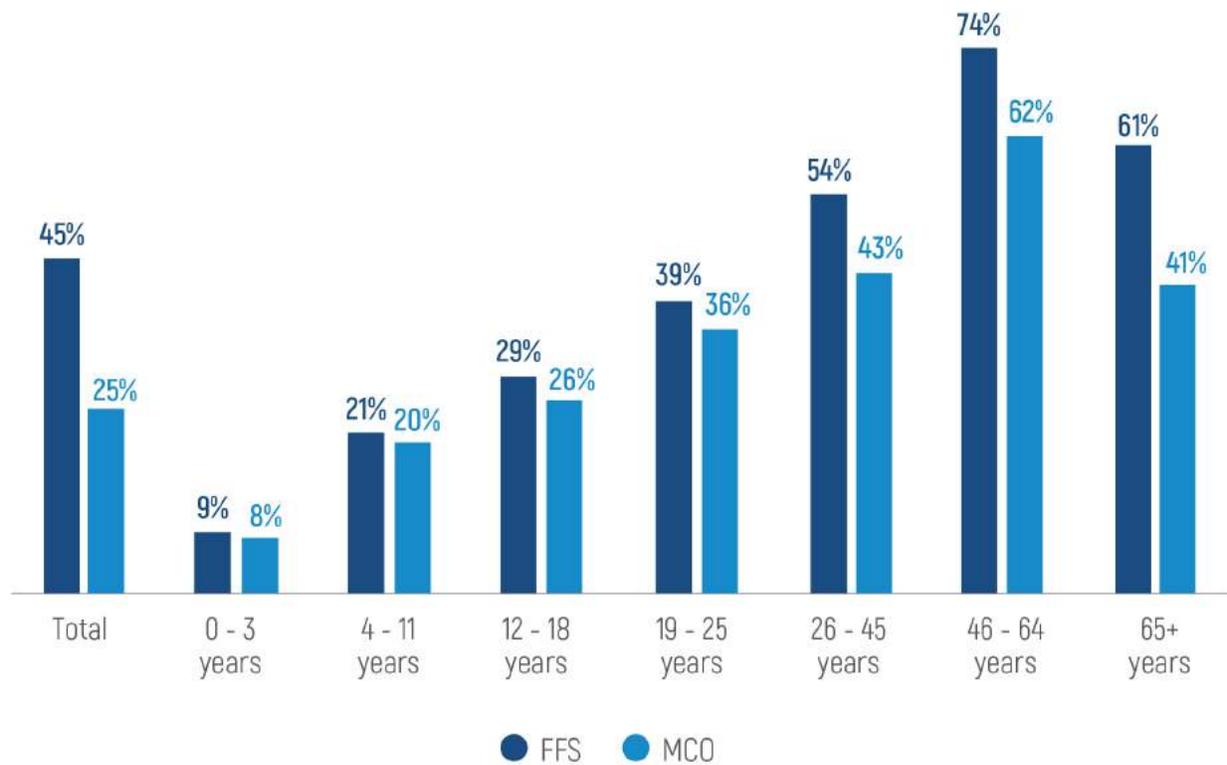
Limited refers to those eligible for limited coverage plans such as the Governor’s Access Plan (GAP) for low-income adults with serious mental illness and Qualified Medicare Beneficiary (QMB) only plans, which includes the eligibility groups, aged and disabled, enrolled in Medicare, under 135% FPL and limits benefits to Medicare premiums, or to Medicare premiums, co-pays and deductibles.

Commonwealth Coordinated Care (CCC) is a recently phased-out initiative “to coordinate care for individuals who are currently served by both Medicare and Medicaid and meet certain eligibility requirements. The program was designed to be Virginia’s single program to coordinate delivery of primary, preventive, acute, behavioral, and long-term services and supports.”

PACE is the Program for All-Inclusive Care for the Elderly by Medicare and Medicaid to provide comprehensive care to allow eligible enrollees to live comfortably outside of nursing facilities.



Figure 7. Percentage of Medicaid Recipients with Behavioral Health Diagnoses by Age and Delivery Model





Access

Access to behavioral health services can be measured in a variety of ways. The data analyzed for this report examines access with respect to services, facilities, and providers.

Services

In FY2017, Medicaid recipients with behavioral health diagnoses had overall 1,340,651 visits across multiple care settings. Medicaid claims data can provide the number of visits in multiple care settings as well as the types of service (inpatient, outpatient and residential) across delivery models to highlight trends. Thirty-nine percent of Medicaid behavioral health service visits were within the mental health system and 37% occurred in primary care settings (Figure 8).

Figure 8. Number and Percentage of Medicaid Behavioral Health Service Visits Across Settings

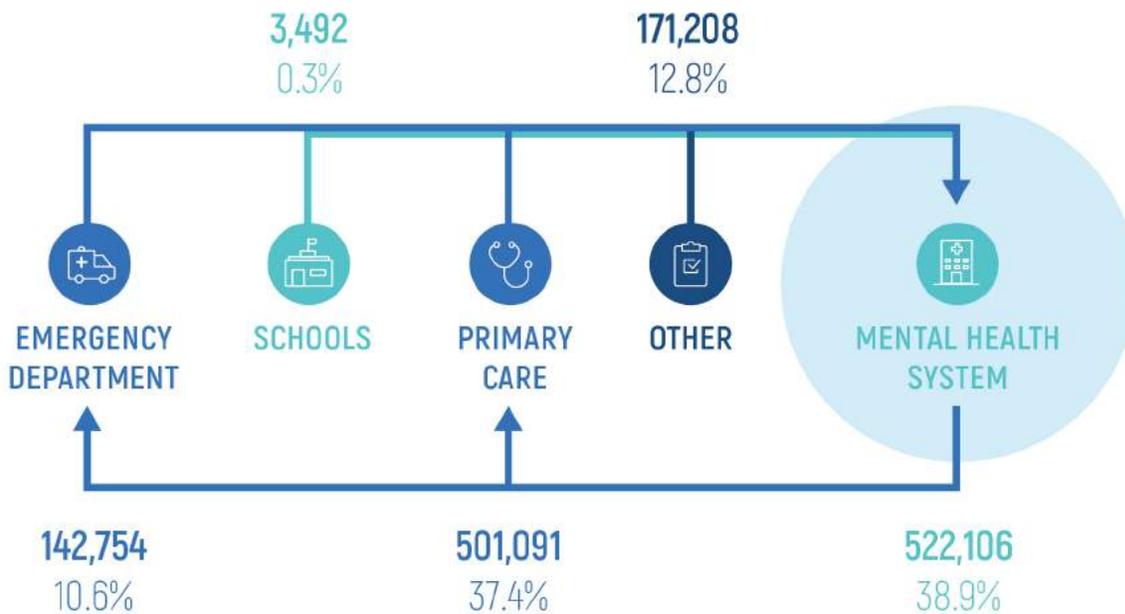


Table 5. Percentage of Visits of Medicaid Recipients with Behavioral Health Diagnoses by Service Type and Delivery Model

Service Type	BHSA	FFS	MCO
Intermediate*	0%	0.40%	0.10%
Inpatient	2.00%	9.50%	14.00%
Outpatient	92.90%	71.90%	68.40%
Residential	1.80%	5.10%	0.60%
Other	3.30%	13.10%	16.90%

*Intermediate refers to Intermediate Care Facilities for the Intellectually disabled.



Facilities

The following maps illustrate private and public behavioral health facilities locations, mental health professional shortage areas, and Community Services Boards locations and corresponding service areas. While facility location is only one component of access (other factors including poverty and wait times also contribute), these maps can be used to show the variation in allocated resources throughout the state.

Figure 9. Map of Private and Public Behavioral Health Facilities

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- DBHDS Regions
- Private Psychiatric Hospitals
- ◆ State-Operated Facilities – DBDHS

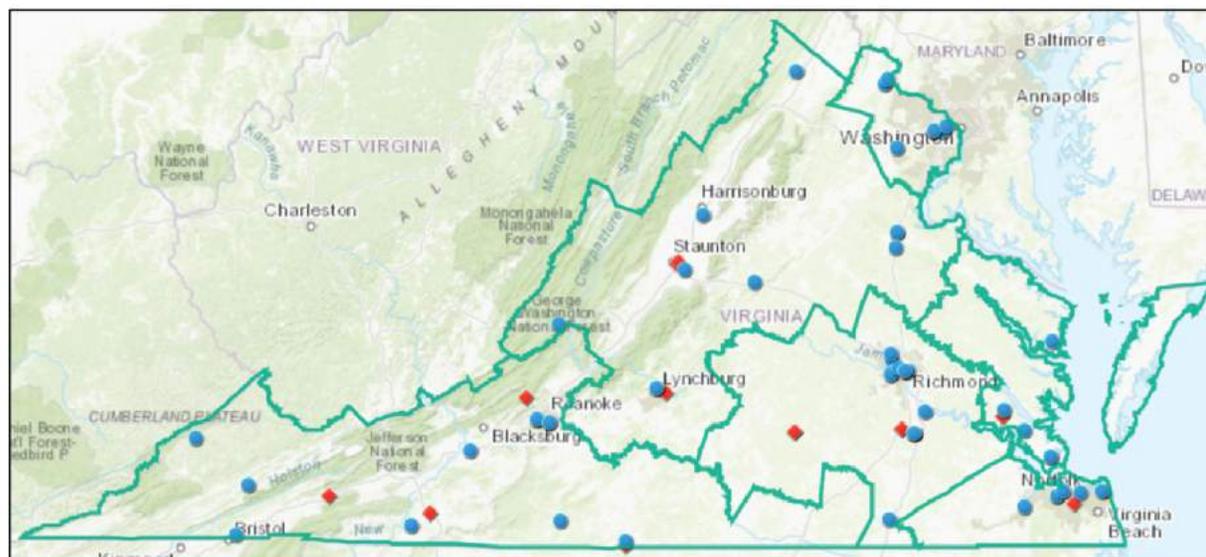
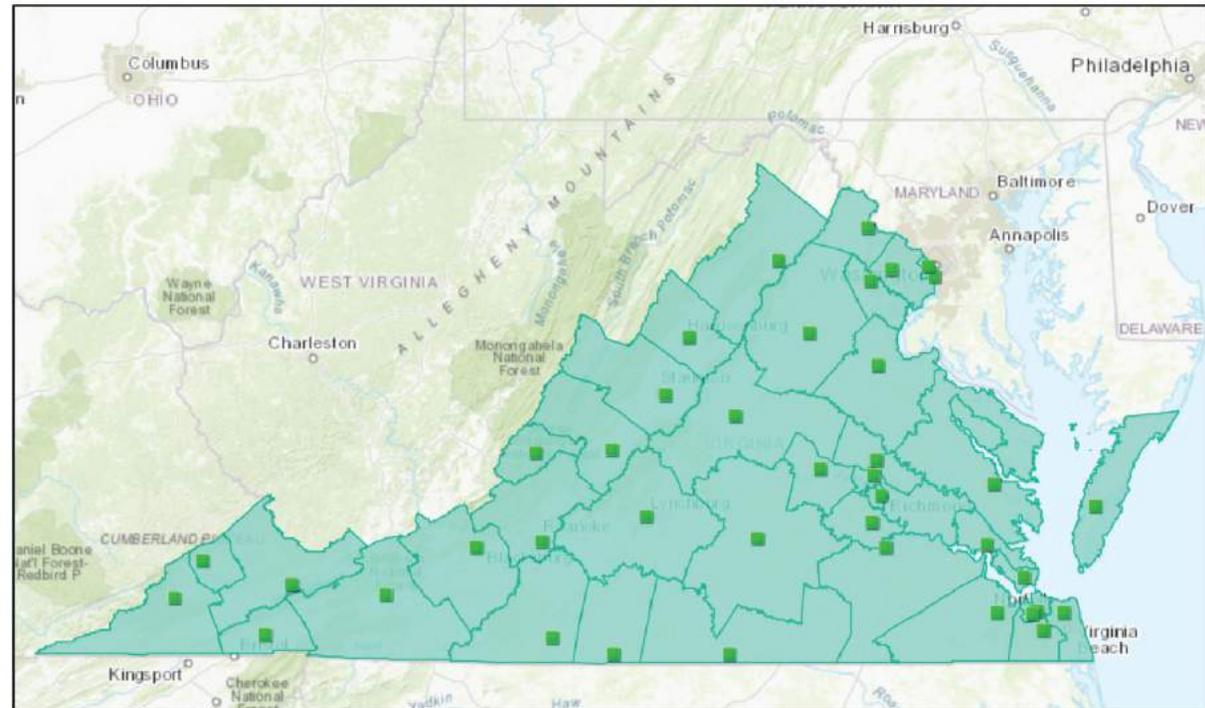




Figure 10. Map of Community Service Boards and Service Areas

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- CSB Locations
- CSB Areas





Providers

Our analyses concur with other studies of utilization among the behavioral health population, demonstrating that the providers who are serving the behavioral health population are generally non-behavioral health providers.¹⁷ Nearly 62% of Medicaid recipients with behavioral health diagnoses were seen by non-behavioral health providers; while 38% were seen by behavioral health providers. Table 6 displays the most prevalent types of behavioral health provider within the FY17 claims. Among behavioral health providers, psychiatrists and neurologists were most commonly listed as the primary provider in claims of Medicaid recipients with behavioral health diagnoses. These data suggest that for behavioral health diagnoses, medical providers are seen more frequently than non-medical providers. Non-behavioral health providers prescribed over 66% of psychiatric medications among Medicaid recipients with behavioral health diagnoses (Figure 11). They also prescribed over half of substance use disorder prescriptions compared to behavioral health providers.

While claims data cannot elucidate all of the reasons why Medicaid recipients are more inclined to receive care in non-behavioral health settings, we can infer from the literature and other data that stigma and access are factors that contribute to patients seeking behavioral health treatment in primary care settings.

Figure 12 displays mental health professional shortage areas in Virginia as designated by the Health Resources and Services Administration (HRSA). The majority of the state is designated as having a shortage of psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialists and marriage & family therapists. A limitation of HRSA data is that they may inaccurately estimate the shortage of behavioral health providers, limiting included types in calculations and excluding substance abuse providers completely. However, these data are the best available and demonstrate a maldistribution of behavioral health providers to meet the needs of Virginians.

Table 6. Top Behavioral Health Provider Types

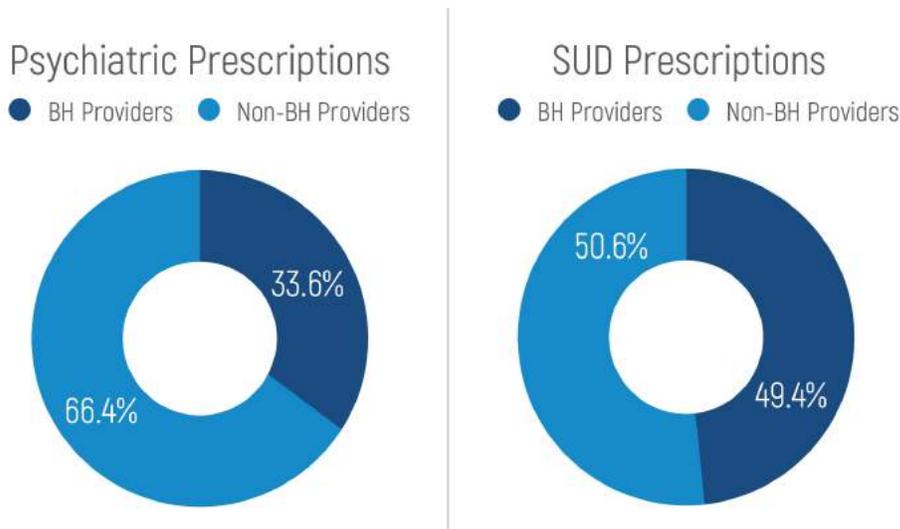
Provider Type⁺	%
Physician: Psychiatry/Neurology	10.51%
MH/MR: Mental Health Clinic	8.01%
MH/MR: Private MHSA Services	5.17%
MH/MR: MR Waiver	2.13%
MH/MR: DD Waiver	2.07%
Licensed Clinical Social Worker	1.77%
Licensed Professional Counselor	1.72%
MH/MR: CSB Mental Health	1.47%
Clinical Psychologist	1.25%

⁺Based on Virginia provider specialty and classification codes

*MH/MR: Mental Health/Mental Retardation

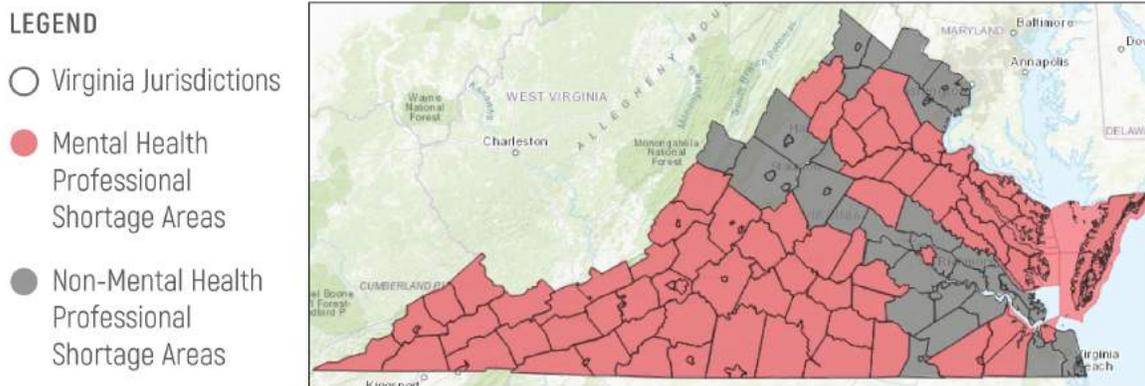


Figure 11. Psychiatric and Substance Use Disorder Prescriptions by Provider Type



*BH Providers include Psychiatrists, Psychologists, LCSWs, Nurses, Nurse Practitioners and other BH providers as classified by DMAS. Non-BH Providers include Physicians (mostly in primary care- family medicine, internal medicine, geriatrics), nurses, nurse practitioners and other medical professionals as classified by DMAS.

Figure 12. Mental Health Professional Shortage Areas



*Note that the Health Resources and Services Administration includes the following provider types in the calculation of Mental Health – Health Professional Shortage Areas: psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialist and marriage & family therapist.



Cost

Understanding the distribution of expenditures can elucidate where resources are currently being allocated and inform if reallocation is needed. The following section identifies expenditure patterns of the behavioral health services paid for by Virginia Medicaid by delivery model and type of care.

Table 7. Total Claims Expenditures by Delivery Model and Types of Care, Total Medicaid FY17

	\$	% of Total
Total Claims Expenditures	\$9,218,133,404	100
FFS	\$5,541,560,106	60.1
Long-Term Care	\$2,684,481,133	29.1
Acute Care	\$1,836,635,717	19.9
Mental Health Services	\$862,339,335	9.4
Case Management	\$158,103,920	1.7
Capitated	\$3,676,573,298	39.9
MCO	\$3,614,153,779	39.2
PACE	\$62,419,519	0.7

Table 8. Total Claims Expenditures by Delivery Model and Type of Care

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Total Claims Expenditures	\$9,218,133,404	100
FFS	\$5,541,560,106	60.1
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Capitated	\$3,676,573,298	39.9
MCO	\$3,614,153,779	39.2
PACE	\$62,419,519	0.7



Table 9. Community Mental Health Service Expenditures in the FFS Delivery Model

Type of Community MH Service	Total Expenditures	% of Total
Mental Health Skill Building	\$250,995,665	39.5
Therapeutic Day Treatment	\$186,000,194	29.2
Intensive In-Home	\$127,614,235	20.1
Psychosocial Rehab	\$29,968,435	4.7
Crisis Stabilization	\$20,645,574	3.2
Intensive Community Treatment	\$13,024,735	2.0
Crisis Intervention	\$4,682,024	0.7
Other	\$3,220,495	0.5
Total	\$636,151,356	100

Figure 13. Total Expenditures of Cost – Community Mental Health Services, 2006-2017

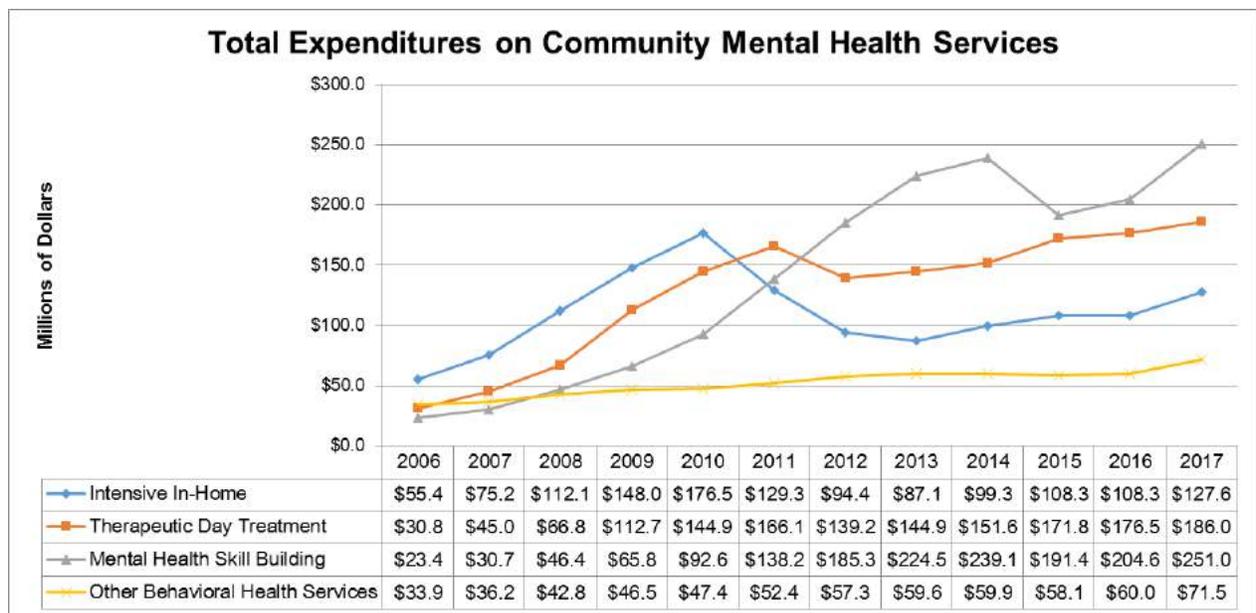




Table 10. Comparison of Expenditures for Specific Community Mental Health Services for Community Service Boards and Private Providers (Non-CSB)

		Expenditures FY17	% of Total for Each Treatment
Intensive In-Home Treatment Total = \$127,614,235	Non-CSB	\$126,110,391	98.8%
	CSB	\$1,503,845	1.2%
Therapeutic Day Treatment Total= \$187,116,301	Non-CSB	\$143,557,814	76.7%
	CSB	\$43,558,487	23.3%
Mental Health Skill Building Services Total = \$252,678,903	Non-CSB	\$238,800,535	94.5%
	CSB	\$13,878,368	5.5%
Other Behavioral Health Services Total= \$71,171,203	Non-CSB	\$30,152,021	42.4%
	CSB	\$41,019,182	57.6%
EPSDT Specialty Services Total= \$80,672,785	Non-CSB	\$80,538,145	99.8%
	CSB	\$134,640	0.2%

Recommendations

Mental health and substance use treatment are essential to health, requiring a system of care that allows for seamless access to mental health and substance use services. The Commonwealth of Virginia has the opportunity to build on strengths of agencies and programs to reshape policies that help meet the behavioral health needs through integrating systems and aligning efforts with greater accountability. Recommendations are multifold and require concurrent action to achieve cost savings and improved health outcomes.

- Define and align geographic regions in order to have consistent strategies and expectations across the state, and across agencies
 - Share responsibility for data exchange and access, quality measures, health outcomes, and cost targets
 - Link data at similar geographic boundaries to establish epidemiologic patterns that inform effective regional policies
 - Manage and update surveillance of behavioral health-related outcomes across agencies to better inform need across the state
 - Establish regular interagency working group meetings for analysts and leadership to troubleshoot issues around data sharing and establishing standards across agencies
 - Identify and prioritize services and resources to meet local needs
- Develop standards, metrics and quality measures for consistent state and local use
 - Apply standards and measures to enforce local accountability at various sites of care for similar services and integrated care delivery
- Examine all access points for care
 - Include primary care settings, emergency departments, schools, public safety and judicial systems, and mental health settings



- Strengthen partnerships to establish data and information sharing across sectors
- Align and leverage efforts to decrease redundancy
- Focus on prevention of behavioral health conditions, identifying access points for preventive care
 - Include primary care settings, schools, school-based health centers, employer-based wellness programs, recreation and art centers, and establish partnerships to advance new and existing opportunities for initiatives
- Design a system to best meet the behavioral health needs of Virginians
 - Expand the definition of access to include proximity, transportation options, and flexibility of hours for Medicaid recipients
 - Increase access and distribution of services across settings outside of community mental health centers and the traditional mental health system
- Enforce accountability for quality care and services with value-based financial models
 - Reform costly programs and revise with new approaches
 - Establish consistent and specific criteria for allocating resources
- Monitor quality measures, health outcomes, and costs of services to ensure good stewardship of state funds that meet the needs of Virginians
 - Allocate resources to establish surveillance of measures, outcomes and costs
 - Maintain and update data management systems
 - Reassess adequacy of chosen measures and outcomes to allocate resources effectively

Conclusion

The Commonwealth of Virginia is poised with a commitment to redesign a system to meet mental health and substance use needs of Virginians. This commitment should be grounded in a recognition that new programs built on the back of a broken system are insufficient to bring about transformative change. Fragmentation, as a driver of high cost, poor outcomes, and dissatisfaction amongst patients and families, must be addressed through integration. For Virginia to create a more robust integrated health system inclusive of mental health and substance use, it will require setting a comprehensive vision for transformation that brings historically disparate pieces together to create a plan for whole health.

The vision for behavioral health access in the future is that there is no wrong door – that any person seeking care will be able to have a clear and consistent pathway to receive that care. To achieve this vision, the Commonwealth of Virginia must make changes to integrate behavioral health care clinically, financially, and operationally while establishing new ways to measure and evaluate the quality of care. A clear operational plan for Virginia requires changing existing elements shown to be ineffective, building off local innovations that work, and increasing accountability for behavioral health across the community to improve health outcomes.



References

1. *Key substance use and mental health indicators in the United States: Results from the 2015 National Survey on Drug Use and Health 2016.*
2. Rui P HE, Okeyode T. . *National Ambulatory Medical Care Survey: 2014 State and National Summary Tables.* Available from: http://www.cdc.gov/nchs/ahcd/ahcd_products.htm .
3. Rui P KK. *National Hospital Ambulatory Medical Care Survey: 2014 Emergency Department Summary Tables.* Available from: http://www.cdc.gov/nchs/data/ahcd/nhamcs_emergency/2014_ed_web_tables.pdf.
4. Curtin SC WM, Hedegaard H. . *Increase in suicide in the United States, 1999–2014.* Hyattsville, MD: National Center for Health Statistics;2016.
5. National Survey on Drug Use and Health. In: Center for Behavioral Health Statistics and Quality S, ed2014-2015.
6. National Survey on Drug Use and Health. In: Center for Behavioral Health Statistics and Quality S, ed2015-16.
7. Medicaid State Fact Sheets. *Kaiser Family Foundation 2017*; <https://www.kff.org/interactive/medicaid-state-fact-sheets/> Accessed 9/2/2017.
8. Mark TL, Yee T, Levit KR, Camacho-Cook J, Cutler E, Carroll CD. Insurance Financing Increased For Mental Health Conditions But Not For Substance Use Disorders, 1986-2014. *Health Aff (Millwood)*. 2016;35(6):958-965.
9. National expenditures for mental health services and substance abuse treatment, 1986–2009. *HHS Publication no SMA-13-4740*. 2013. <http://store.samhsa.gov/shin/content/SMA13-4740/SMA13-4740.pdf>.
10. Weldon Cooper Center for Public Service DRG. Intercensal estimates. www.coopercenter.org/demographics. Accessed September, 2017.
11. HCUP Clinical Classifications Software (CCS) for ICD-9-CM. Healthcare Cost and Utilization Project, Agency for Healthcare Research and Quality; 2006-2009. www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp. Accessed February 12, 2016.
12. Bank FD. MedKnowledge Formerly NDDF. In:2017.
13. Medicaid CfMa. Place of Service Codes for Professional Claims. https://www.cms.gov/Medicare/Coding/place-of-service-codes/Place_of_Service_Code_Set.html.
14. Managed Care Regions. 2017; http://www.dmas.virginia.gov/Content_atchs/mc/mc-map.pdf.
15. Local Health Districts. 2017; <http://www.vdh.virginia.gov/local-health-districts/>.
16. Esri. Esri ArcGIS. www.esri.com. Accessed September, 2017.
17. deGruy FV, 3rd. Mental health diagnoses and the costs of primary care. *J Fam Pract*. 2000;49(4):311-313.



Appendix A. Behavioral Health Data Sources and Methodology

Data were analyzed from DMAS, DBHDS, and VDH. The following is a list of specific data sources from each department:

- Department of Medical Assistance Services
 - Claims Data from Fiscal Year 2017
- Department of Behavioral Health and Developmental Services
 - Psychiatric Free-Standing Hospitals
 - State-funded BH Facilities
 - CSB Locations and Service Areas
- Department of Health
 - Population Health Outcomes, 2015
 - Mortality Rates
 - BH Outcomes including Self-Reported MH Status and many others

For the claims data received from DMAS, the diagnoses, prescription classes and place of service codes used are defined using standard classification methods. Behavioral health diagnoses included mental health disorders and substance use disorders. We used the Agency for Healthcare Quality's Healthcare Cost and Utilization Project Clinical Classifications Software (CCS) to categorize diagnostic codes (see Appendix for specific codes).¹¹ The following CCS codes were used to classify behavioral health diagnoses:

Prescriptions for Behavioral Health conditions were classified using First Databank's Hierarchical Specific Therapeutic Class Code (HIC-3), which is a component of the National Drug Data File.¹² The treatment setting for claims are classified using the Centers for Medicare and Medicaid's Place of Service Codes for Professional Claims.¹³

For the data from DMAS, unique member counts were calculated from encounter and claims data and aggregated by regional designations¹⁴ prior to receipt by Farley Center. Descriptive statistics were conducted to describe Medicaid members or the number of services. Fee-for-service claims and managed care organization (MCO) encounter data were analyzed separately. Aggregate-level data cannot infer upon individual-level measures nor can this analysis of cross-sectional data infer causality; therefore, descriptive statistics should be interpreted with caution.

For the data from VDH, descriptive statistics were conducted on data that were aggregated to the Local Health Districts¹⁵. Geographic data from DBHDS was collected, geocoded and mapped into ArcGIS® software by Esri (Copyright © Esri¹⁶). These data were used to create the mapping tool for Virginia Behavioral Health data.