



To: Members of the State Board of Health

From: Stephen Holloway, Branch Chief, Health Access Branch,
Prevention Services Division

Through: Erin Ulric, Prevention Services Division Director (Interim)

Date: December 19, 2018

Subject: **Rulemaking Hearing**
Proposed Permanent Adoption and Amendments to 6 CCR 1015-6, rules
pertaining to State-Designated Health Professional Shortage Areas, hearing
to occur on December 19, 2018

The department's Primary Care Office (PCO) requests Emergency Rule 6 CCR 1015-6 be enacted permanently and be revised according to the amendments described in this briefing. These rules establish methodologies for State-Designated Health Professional Shortage Areas (HPSA). Rulemaking is authorized by the passage of Senate Bill 18-024, "Expand Access to Behavioral Health Care Providers," Section 25-1.5-404 (1)(a) C.R.S.

Permanent enactment is requested because the burden of Substance Use Disorder (SUD) in Colorado is increasing. Opioid misuse has been declared a national public health emergency and mortality caused by acute drug intoxication (overdose) in Colorado has increased since 2000 by 170 percent and 300 percent for adults 25 to 34 and 55 to 64, respectively.

In order to respond to the public health crisis of SUD, greater access to secondary and tertiary treatment services is needed. Because access to treatment for SUD is substantially dependent on the capacity of community level behavioral health clinicians, the legislature has directed the PCO to expand the Colorado Health Service Corps (CHSC) (Section 25-1.5-501 *et seq*, C.R.S.) to include clinician practice incentives for SUD professionals to work in state-designated HPSAs.

These rules are a necessary prerequisite to the effective distribution of CHSC resources to areas of Colorado with the most acute SUD provider shortages. Alternative HPSA models are inadequate in describing specific provider shortages for SUD professionals. If state rules are not created, available state resources intended to improve access to SUD care may not be efficiently targeted or could be reverted to the state treasury.

Substantive changes since the emergency rulemaking are highlighted in yellow. The methodology establish in rule is unchanged. The changes discussed communicate an improved

application of the catchment area and increased data concerning the estimated supply of substance use disorder services.

**STATEMENT OF BASIS AND PURPOSE
AND SPECIFIC STATUTORY AUTHORITY**

6 CCR 1015-6, State-Designated Health Professional Shortage Area Methodology

Basis and Purpose:

Legislative Background

In 2017, the Opioid and Other Substance Use Disorders Interim Study Committee and Task Force met to study the following:

- a review of data and statistics on the scope of the substance use disorder problem in Colorado, including trends in rates of substance abuse, treatment admissions, and deaths from substance use;
- an overview of the current prevention, intervention, harm reduction, treatment, and recovery resources, including substance abuse prevention outreach and education, available to Coloradans, as well as public and private insurance coverage and other sources of support for treatment and recovery resources;
- a review of the availability of medication-assisted treatment and whether pharmacists can prescribe those medications through the development of collaborative pharmacy practice agreements with physicians;
- an examination of what other states and countries are doing to address substance use disorders, including evidence-based best practices and the use of evidence in determining strategies to treat substance use disorders, and best practices on the use of prescription drug monitoring programs;
- identification of the gaps in prevention, intervention, harm reduction, treatment, and recovery resources available to Coloradans and hurdles to accessing those resources; and
- identification of possible legislative options to address gaps and hurdles to accessing prevention, intervention, harm reduction, treatment, and recovery resources.¹

SB 18-024 Implications for Rulemaking

During the 2018 legislative session, Senate Bill 18-024 was recommended by the Opioid and Other Substance Use Disorders (SUD) Interim Study Committee. SB 18-024 is one of five successful legislative proposals introduced during the 2018 legislative session to specifically address the opioid epidemic and SUD in Colorado. SB 18-024 expands the scope of the Colorado Health Service Corps (CHSC) loan repayment program to include clinicians and facilities that provide treatment for SUD and experience a shortage of health care professionals. SB 18-024 also expands loan repayment from licensed health professionals to licensed health professionals and candidates for licensure in professions associated with the

¹ Charge and Membership of the Opioid and Other Substance Use Disorders Interim Study Committee and Task Force, Colorado Legislative Council (June 28, 2017)

treatment of SUD. The CHSC improves access to health care by incentivizing clinical practice in areas of Colorado determined to have a shortage of health professionals.

In addition to these changes to the CHSC program, SB 18-024 created authority for state-designation of Health Professional Shortage Areas (HPSA) which will exist in parallel to federal HPSA designations. This authority is important because the Department has found that current federal methods do not adequately inform state decisions regarding emerging needs for improved health care services related to the treatment of SUD. Federal methods do not consider the unique systems and professions required to deliver comprehensive SUD care or consider the population level indicators of risk for SUD. For example, federal rules only measure physicians boarded in psychiatry when evaluating workforce capacity rather than the full range of behavioral health professionals and assume a constant rate of need for care within a population regardless of age, sex or other demographic factors that correlate with SUD risk.

The Department's Primary Care Office (PCO) requests promulgation of permanent rules that establish the first methodology for State-Designated HPSA for the behavioral health workforce engaged in SUD treatment. The shortage designation analysis and process, as described in the amended rule will produce detailed quantitative information regarding local shortages of health professionals who provide treatment for SUD. Other rulemaking for primary care, oral health, and mental health as authorized by SB 18-024 will follow at a later date. HPSA for SUD is prioritized because it is the primary subject of SB 18-024 and rulemaking is necessary for its full implementation. Other parts of the existing CHSC program will continue to rely upon federal HPSA designation until state HPSA rules are promulgated.

Once the emergency rule for SUD HPSA becomes permanent, approximately \$950,000 (appropriated in FY 2018-2019 less the amount awarded in the September 2018 application round) will be distributed in the form of educational loan repayment to clinicians who provide SUD treatment services in state-designated HPSA. The CHSC program reduces educational loan debt of qualified health professionals in exchange for a minimum three years of clinical service in an area of the state determined to have a shortage of providers. CHSC participants must agree to provide care to all individuals regardless of ability to pay.

The department anticipates participation in the program will increase over time. The priority for the new funds is to support the behavioral health work force (41 three-year loan repayment agreements in the average amount of \$55,000 anticipated); however, if there is insufficient applications, the department is authorized to use these funds for the existing CHSC loan repayment program.

The rule will also be used for individuals who will receive a scholarship to complete certifications in addictions counseling as established by SB 18-024 (Section 25-1.5-503.5, C.R.S.). Approximately \$75,000 will be made available for scholarship awards in FY 2018-2019 (21 scholarships in the average amount of \$3,500 anticipated).

These amended permanent rules will be effective in time for the March 2019 application cycle. The department has applied lessons learned from initial implementation of the methodology to inform improvements to the rule as amended in this request.

Description of the Methodology

Population

The population considered for analysis was all persons who are resident² in Colorado but not part of a group quarter such as a military base or correctional facility. Group quartered populations were excluded from analysis because behavioral health services are presumed to be provided in closed health care delivery systems that are supported and maintained specifically for the quartered population. The cross interaction of behavioral health services supply and demand between quartered and unquartered populations within the same service area are assumed to be de minimis.

Estimating Demand for SUD Treatment

A table of civilian population estimates in Colorado was created from data downloaded from American FactFinder³ (American Community Survey, 2012-2016 5-year estimates, Table B21001). The table consisted of civilian noninstitutionalized population totals for each Colorado census block group⁴ broken down by age and sex.

² Where individuals live and sleep most of the time. The resident population excludes people whose usual residence is outside of the United States, such as the military and federal civilian personnel living overseas, as well as private U.S. citizens living overseas.

³ American FactFinder is the United States Census Bureau's online self-service data tool, which supports public query of population, economic, geographic, and housing data.

⁴ Census block groups are statistical divisions of census tracts that generally contain between 600 and 3,000 residents.

The number of individuals experiencing SUD at the block group level was estimated by multiplying the male and female civilian population by age according to the following table.

Age	Male	Female
18-25	25.7%	12.9%
26-34	17.6%	8.8%
35-49	10.4%	5.2%
50-64	6.1%	3.1%
65 or older	2.5%	1.3%

The SUD multiplier by age and sex was derived from national data from the report "Behavioral Health, United States, 2012" page 36 "Table 2. Past year mental illness and substance use disorders among adults, by selected characteristics: percentage, United States, 2010-2011 combined" and, page 44 "Table 5. Past year substance use disorders among adults, by sex: percentage, United States, 2010-2011 combined" (Substance Abuse Mental Health Services Administration, 2012).

From the estimate of individuals with SUD at the census block group level, an estimated treatment encounter demand for community-based services was derived by multiplying the total individuals with SUD by eight. The treatment encounter demand multiplier was obtained from the National Comorbidity Survey - Replication (NCS-R) report, which defines minimally adequate treatment⁵ for SUD as eight or more visits with any health care or human services professional lasting an average of 30 minutes or more.

⁵ Minimal adequacy for SUD treatment encounters was determined by evaluating recommendations and guidelines from the American Psychiatric Association (APA) and the Agency for Healthcare Research and Quality (AHRQ).

Estimating Supply of SUD Treatment

A table of behavioral health professionals who are licensed in Colorado and have evidence of recent practice within the state was downloaded from the Colorado Health Systems Directory.⁶ The table consisted of the name, license type, professional discipline, and practice location(s) of each behavioral health professional.

Behavioral health clinicians in the report were surveyed to determine SUD treatment capacity for each clinician. Nonresponders to the survey were assigned productivity rates of responding clinicians according to professional discipline and geographic area.

Using the surveyed and estimated treatment encounter supply for each clinician type, an aggregate treatment encounter supply was created for each census block group. This was accomplished by summing the total estimated encounters by clinician for all behavioral health clinicians with a practice address in the block group.

Estimating the Spatial Relationship of Supply and Demand for SUD Treatment

The relationship of demand and supply for SUD treatment encounters was evaluated at the service area level. Service area is defined as a discrete geographic area where a preponderance of the civilian noninstitutionalized population within the service area could reasonably expect to access behavioral health services within the service area, when it is adequately resourced. All providers within the service area are presumed to be generally accessible and similarly proximate to the residents of the service area. SUD service locations that lie outside of the service area are assumed to be generally inaccessible by distance for the purposes of analysis.

To estimate the availability of treatment resources within each block group, considering the demand for and supply of SUD treatment encounters within the service area the Variable Two-step Floating Catchment Area (V2SFCA) method developed by Wei Luo and Tara Whippo was applied (Luo and Whippo, 2012). The V2SFCA method was selected because spatial accessibility of treatment for SUD is not defined by the boundaries of a block group or any other census or political subdivision. This is because most civil boundaries of this type can be easily traversed by patients for the purposes of acquiring health services.

The application of the V2SFCA began with representing the population as a travel centroid⁷ for each block group. The boundaries of each catchment area are then calculated by

⁶ The Colorado Health Systems Directory is a work product of the PCO, which provides a comprehensive database of all licensed clinicians and health care sites in Colorado. The database aggregates information from multiple data sources, matches records from those sources, standardizes information contained within those sources, and applies a probabilistic algorithm to determine current practice information for clinicians at the date of query.

⁷ A travel centroid is the geometric center of a group of points within a geographic shape (e.g., Census block group) where the center point generally falls within the shape.

determining the total population within each provider location's catchment area. If the base population threshold is not met within 20 minutes travel time (derived from ESRI Street Map data, ArcGIS v. 10.4x), the catchment area is expanded to 40 minutes travel time. If the base population threshold is not met at 40 minutes travel time, the catchment area is expanded to 60 minutes. The ratio of encounter supply to encounter demand is then calculated for each catchment area according to the following formula.

$$(\text{encounter supply}/\text{encounter demand}) * \text{distance decay function weight}$$

Once the catchment area was defined by the travel polygon,⁸ the sum of predicted demand for SUD treatment encounters and the sum of predicted supply of SUD treatment encounters for each block group within the boundaries of the catchment area was calculated.

Figure 1: Hypothetical Catchment Area Map with Travel Polygon

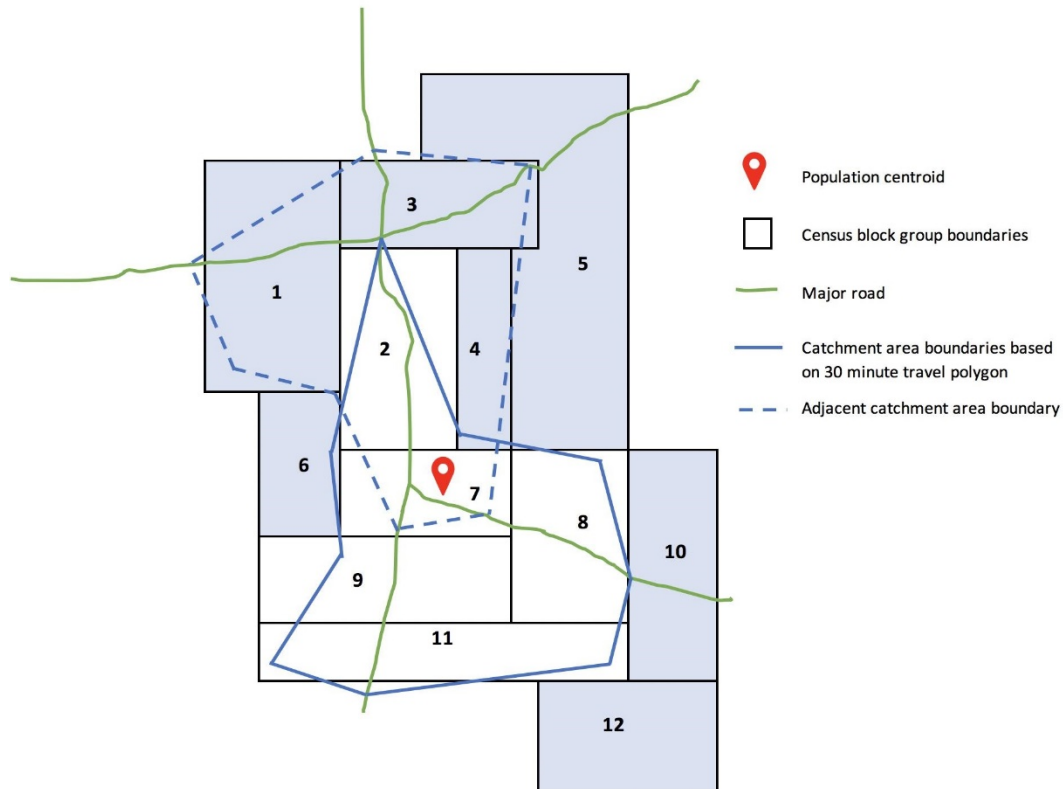


In the example represented in Figure 1, estimated SUD treatment encounter demand from block group 1, 2, 3, 4, and 7 would be summed to estimate total encounter demand in the catchment area. Similarly, estimated treatment encounter supply from block group 1, 2, 3, 4, and 7 would be summed to estimate total encounter supply in the catchment area. A ratio of encounter supply to encounter demand for the catchment area is then derived for each census block group.

⁸ A closed, irregular geometric shape on a map surface that defines equivalent road travel distances from a central point within the shape.

In the example represented in Figure 2, estimated SUD treatment encounter demand from block group 2, 7, 8, 9, and 11 would be summed to estimate total encounter demand in the catchment area and the encounter supply from the same block groups would be summed to estimate total encounter supply in the catchment area.

Figure 2: Hypothetical Catchment Area Map with Travel Polygon



The catchment area definition process and demand supply computation is repeated for each block group in the state. As expected under the V2SFCA model, adjacent block groups of relatively small geographies tended to create overlapping or “floating” catchment areas. In these two hypothetical examples block group 2 and block group 7 are included in both hypothetical catchment area constructions.

Calculating the Ratio of Supply and Demand for SUD Treatment and Stratifying Shortage

The ratio of demand to supply was calculated for all 3,532 census block group catchment areas in Colorado. The resultant ratio of encounter demand to supply was then binned into ten deciles. Those catchment areas where the ratio fell below 8.2 encounters per person with SUD is deemed to be a HPSA for SUD treatment.

Limitations

1. Census block group level population estimates have a higher error rate than larger census geographies such as census tracts or metropolitan statistical areas. Use of block groups improves discrete area analysis but may introduce more error. The overlapping nature of the floating catchment area analysis could reduce the overall effect of individual block group population error rates.
2. Individual provider encounter capacity of survey nonresponders was derived by applying the rates of responders according to discipline and geography. The characteristics of responders and nonresponders cannot be presumed to be the same thus making the assignment of the same productivity rate less ideal. Statistical methods will be applied in the future to increase confidence in estimating productivity of nonresponders.
3. The minimally adequate treatment benchmark for SUD was reported as eight visits of 30 minutes or longer. Though the NCS-R reported this rate as derivative of analysis of Agency for Health Research and Quality and the American Psychological Association sources, its determination was made prior to the enactment of the ACA and the Mental Health Parity and Addiction Equity Act (2008). These two changes in federal law increased standard minimum coverage for behavioral health care services. It may be that the standard of eight visits established a decade ago was somewhat suppressed by lack of insurance or inadequate insurance. Total coverage for behavioral health care in both private and public plans has improved since 2008, which may have led to changes in care acquisition or care referral, causing typical SUD treatment intensity per patient to rise.

There may be reason to maintain the standard minimum treatment rate of eight visits per episode of SUD in the model even if changes to this recommendation become known in the future. This is because the modest standard of eight treatment visits results in significant portions of Colorado being deficient in encounter capacity. If a higher standard for minimum treatment were applied to the predicted demand formula, fewer areas of the state would be determined to have adequate or surplus treatment supply. This would effectively reduce the resolution of analysis in determining areas of greatest need and thus reduce the value of the tool in identifying those areas with the most significant shortages.

4. Burden data applied to the model for substance use disorder does not include rates for adolescents between 12 and 18 and are not specific to Colorado. Additional specificity in the data may be possible through a data agreement with the Substance Use Mental Health Services Administration. The PCO is pursuing this avenue presently.

Application to Colorado Health Service Corps Program

Shortage designation determines which geographic areas of the state experience a shortage of health care professional capacity relative to the needs of the population. Independent of this rule, the CHSC also assesses individual clinical locations to determine eligibility of participation in the CHSC program. Criteria used to determine eligibility include that the practice accepts all patients regardless of ability to pay, has an established nondiscrimination policy, accepts Medicaid, Medicare, and the Child Health Plan+, and offers treatment services for SUD.

Individual clinician participants in the CHSC must apply to the program to participate. Clinicians are selected for personal attributes that indicate a higher likelihood of long term retention in practice in the shortage area once the service obligation to the state is concluded. Attributes of "retainability" include training specific to rural or underserved practice, personal commitment to the needs of the underserved, personal experience of being underserved, graduation from a Colorado based education program, and ability to deliver clinical services in a language other than English.

Specific Statutory Authority.

These rules are proposed pursuant to Section 25-1.5-404, C.R.S. and Section 25-1.5-501 *et seq*, C.R.S.

SUPPLEMENTAL QUESTIONS

Is this rulemaking due to a change in state statute?

Yes, the bill number is SB 18-024. Rules are authorized required.
 No

Is this rulemaking due to a federal statutory or regulatory change?

Yes
 No

Does this rule incorporate materials by reference?

Yes
 No

Does this rule create or modify fines or fees?

Yes
 No

Does the proposed rule create (or increase) a state mandate on local government?

No. This rule does not require a local government to perform or increase a specific

activity for which the local government will not be reimbursed. Though the rule does not contain a state mandate, the rule may apply to a local government if the local government has opted to perform an activity, or local government may be engaged as a stakeholder because the rule is important to other local government activities. If it is not a mandate because local government will be reimbursed, identify the legislation, appropriation and/or funding stream in the Regulatory Analysis.

REGULATORY ANALYSIS

6 CCR 1015-6, State-Designated Health Professional Shortage Area Methodology

1. **A description of the classes of persons affected by the proposed rule, including the classes that will bear the costs and the classes that will benefit from the proposed rule.**
 - A. Identify each group of individuals/entities that rely on the rule to maintain their own businesses, agencies or operation, and the size of the group:

Implementation of this rule will be the charge of the Department's Primary Care Office (PCO).

Entities that employ clinicians who treat Substance Use Disorder (SUD) may benefit from this rule in that their provider recruitment and retention costs will be reduced when clinicians receive incentives to practice in State-Designated Health Professional Shortage Areas (HPSA) where their agencies are located. In excess of 300 health care sites could conceivably receive some direct or indirect benefit of the shortage designation process.

- B. Identify each group of individuals/entities interested in the outcomes the rule and those identified in #1.A achieve, and if applicable, the size of the group:

Organizations that promote better access to health services for medically underserved populations may also benefit from the assessment of need and the promotion of improved access for underserved people. Perhaps 15 to 20 organizations and advocacy groups may benefit from this rule in this way. Other state and local governments, such as human services and criminal justice, would benefit if Colorado is better able to address SUD.

- C. Identify each group of individuals/Entities that benefit from, may be harmed by or at-risk because of the rule, and if applicable, the size of the group:

The burden of SUD in Colorado is higher than the nation as a whole, where an estimated 358,000 Coloradans had a SUD (Substance Abuse Mental Health Services Administration, 2012). Approximately 796,000 Colorado residents disclose that they have used an illicit drug in the last month (National Survey on Drug Use and Health, 2017). State trends in illicit substance use have consistently paralleled national trends since at least 1999. Colorado's experience with the epidemic indicates that risk of fatal overdose for all illicit drugs is highest among those between the ages of 35 and 54. In the current decade, drug overdose mortality characterized by age has broadened to the younger age band of 25 to 34 and to the older age band of 55 to 64. Between 2000 and 2015, overdose mortality in these two age groups in Colorado has increased by 170 percent and 300 percent, respectively. Opioid use is higher in men in Colorado, as it is nationally, and men are far more likely than women to die from heroin overdose in Colorado. Overdose rates in women have annually increased faster than with men at 125 percent versus 88 percent, respectively.

Those who are experiencing SUD in Colorado and receive improved access to secondary and tertiary treatment service as a result of this rule, will most benefit. Those individuals with SUD treatment needs who are uninsured, publicly insured, low income, or geographically isolated may benefit most because these classes of persons have the highest barriers to receiving adequate SUD treatment services.

No person or class of persons are likely to be harmed by this rule nor will any directly bear the costs of this rule. All costs are borne by a specific state appropriation derived from retail marijuana tax revenue.

2. To the extent practicable, a description of the probable quantitative and qualitative impact of the proposed rule, economic or otherwise, upon affected classes of persons.

A. For those that rely on the rule to maintain their own businesses, agencies or operations:

Entities that employ clinicians who treat SUD may experience reduced costs of provider recruitment and retention. The magnitude of this effect is not precisely known but could be substantial in aggregate. There are no anticipated negative impacts of this proposed rule upon these entities.

Anticipated financial impact:

Anticipated Costs:	Anticipated Benefits:
<p>Description of costs that must be incurred.</p> <ul style="list-style-type: none"> • None <p>Description of costs that may be incurred.</p> <ul style="list-style-type: none"> • None 	<p>Description of financial benefit.</p> <p>Costs associated with recruiting health care professionals to underserved Colorado communities can be substantial (in excess of \$100,000 for certain physician specialties for example). Most Colorado Health Service Corps (CHSC) clinicians report that loan repayment had a meaningful effect on their decision on where to practice (program evaluation 2017). Current CHSC employers report that loan repayment is an important component of their recruitment and retention strategy.</p> <p>State financed practice incentives that will a result from this rule will lower employer retention costs. This is true even for those clinicians who do not ultimately receive a CHSC award but were motivated to apply for qualified</p>

	<p>employment for the prospect of educational loan repayment.</p>
<p>Cost or cost range. \$ <u>none</u> or <u> </u> No data available.</p>	<p>Savings or range of savings.</p> <p>If employer recruitment costs are reduced by a conservative \$5,000 per CHSC applicant for clinician types eligible for CHSC, aggregate annual employer savings could exceed \$1,025,000. These savings are estimated according to the following:</p> <ul style="list-style-type: none"> • Employers recruit health professionals in advance of clinicians' CHSC application. • Recruitment and retention cost savings accrue to employers when clinicians choose to work at eligible practice sites for the prospect of loan repayment benefits, regardless of whether individual clinicians receive a CHSC award. • The CHSC program typically receives five applications for each available award. • If 205 CHSC applications are received in year one (41 x 5) and employers experience a modest \$5,000 per applicant reduction in recruitment costs per applicant, then aggregate recruitment cost savings per year experienced by all employers will be approximately \$1,025,000 (205 x 5,000).
<p>Dollar amounts that have not been captured and why: N/A</p>	<p>Dollar amounts that have not been captured and why:</p> <p>There are positive secondary economic benefits to health systems capacity development in underserved communities. For example, multiple non-clinical jobs are created when clinicians are added in a given service area. Communities also benefit when economic activity related to health care spending occurs within their community as opposed to adjacent communities where access to care may be better.</p>

Local Government Impact: No direct impact.

Statement from SB 18-024 Fiscal Note: N/A

B. For those that are affected by or interested in the outcomes the rule and those identified in #1.A achieve.

Favorable non-economic outcomes:

For individuals that are publicly insured, treatment participation may increase thus increasing the demand for public financing of care; however, it is anticipated that these costs will be offset and outweighed by the health care costs for individuals that do not address their SUD and experience other comorbidities as a result.

SB 18-024 directed that the department coordinate with the Department of Health Care Policy and Financing. This has occurred.

The CHSC and this rule may enhance resource allocation and policy attention of organizations that promote better access to health services for medically underserved populations, nongovernmental organizations that advocate for the needs of underserved populations, and support other state agencies and local governments.

Unfavorable non-economic outcomes:

None are anticipated.

Any anticipated financial costs monitored by these individuals/entities?

See above.

Any anticipated financial benefits monitored by these individuals/entities?

See above.

C. For those that benefit from, are harmed by or are at risk because of the rule, the services provided by individuals identified in #1.A, and if applicable, the stakeholders or partners identified in #1.B.

Describe the favorable or unfavorable outcomes (short-term and long-term), and if known, the likelihood of the outcomes:

There are many strategies to improve access to care. This rule and the work of the CHSC is one component of a complex social issue and service array. Appreciating that individuals may have individual barriers to seeking care and

health care costs influence our health care costs, this rule contributes to the effort by making sure persons experiencing SUD have those services available in their community.

As care capacity increases in areas with a health professional shortage, morbidity and mortality attributable to or associated with SUD is expected to decrease. Clinicians who receive practice incentives resulting from shortage analysis under this rule may collectively provide 67,000 treatment encounters for SUD in year one. By year three, total encounters for SUD by those who are contracted with the program may increase to 201,000 per year.

Financial costs to these individuals/entities:

There are no anticipated financial costs to individuals or entities directedly related to the enactment of this rule.

Financial benefits to or cost avoidance for these individuals/entities:

Those who receive better access to treatment for SUD experience lower costs for all health care needs and better health outcomes. Treatment for individuals experiencing SUD may reduce substance use, improve psychiatric symptoms and functioning, decrease acute hospitalizations, increase housing stability, reduce justice involvement, and improve quality of life and social function.

3. The probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues.

Implementation of the rule is expected to generate department costs related to personnel and computational services only. Cost estimates are as follows. This rule will not require enforcement.

A. Anticipated CDPHE personal services, operating costs or other expenditures specific to the SUD HPSA:

Type of Expenditure	Year 1	Year 2
Personnel Time	\$ 33,668	\$ 28,202
Data collection, analysis and systems database	\$ 16,000	\$ 5,000
Total	\$ 49,668	\$ 33,202

Expenditures are less than that stated on the fiscal note because this table reports only those costs associated with rule implementation.

Anticipated CDPHE Revenues: Not Applicable

- B. Anticipated personal services, operating costs or other expenditures by another state agency:

None at this time.

4. A comparison of the probable costs and benefits of the proposed rule to the probable costs and benefits of inaction.

Check mark all that apply:

- Inaction is not an option because the statute requires rules be promulgated.
- The proposed new rules are necessary to comply with federal or state statutory mandates, federal or state regulations, and department funding obligations.
- The proposed new rules appropriately maintain alignment with other states or national standards.
- The proposed new rules implement a Regulatory Efficiency Review (rule review) result, or improve public and environmental health practice.
- The proposed new rules implement stakeholder feedback.
- The proposed new rules advance the following CDPHE Strategic Plan priorities:

Goal 1, Implement public health and environmental priorities
 Goal 2, Increase Efficiency, Effectiveness and Elegance
 Goal 3, Improve Employee Engagement
 Goal 4, Promote health equity and environmental justice
 Goal 5, Prepare and respond to emerging issues, and comply with statutory mandates and funding obligations

Strategies to support these goals:

- Substance Abuse (Goal 1)
- Mental Health (Goal 1, 2, 3 and 4)
- Obesity (Goal 1)
- Immunization (Goal 1)
- Air Quality (Goal 1)
- Water Quality (Goal 1)
- Data collection and dissemination (Goal 1, 2, 3, 4 and 5)
- Implements quality improvement or a quality improvement project (Goal 1, 2, 3 and 5)
- Employee Engagement (career growth, recognition, worksite wellness) (Goal 1, 2 and 3)
- Incorporate health equity and environmental justice into decision-making (Goal 1, 3 and 4)

- ✓ Establish infrastructure to detect, prepare and respond to emerging issues (Goal 1, 2, 3, 4, and 5)

5. A determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule.

Rulemaking is the only statutorily allowable method for achieving the purpose of the statute. Implementation of this rule is not expected to be intrusive on any affected person or class of persons. Costs of implementation are borne by a specific state appropriation to the PCO for the purpose of administering state health professional shortage area designation. These proposed rules provide the most benefit for the least amount of cost and are the minimum necessary to achieve compliance with statute.

6. Alternative Rules or Alternatives to Rulemaking Considered and Why Rejected.

This rule is required by statute, therefore there are no alternatives to rulemaking.

7. To the extent practicable, a quantification of the data used in the analysis; the analysis must take into account both short-term and long-term consequences.

Proposed rules will apply a “variable two-step floating catchment area” method first proposed by Luo and Whippo in 2012 (Measures of Spatial Accessibility to Health Care in a GIS Environment: Synthesis and a Case Study in the Chicago Region. Environment and Planning B: Planning and Design, 30, 865-884.)

Instruments that were applied in the test analysis included:

- ArcView GIS®, Version 10.4.1 © 2018 Esri
- Microsoft® Excel, Version 16.13.1 (180523). © 2018 Microsoft
- Qualtrics®, subscription data collection software, © 2018 Qualtrics
- Remark® Office OMR, © 2018 Gravic, Inc.

These instruments may be replaced with similar tools in implementation of the final rule and future shortage assessments.

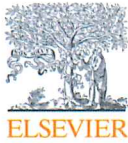
Data sources that inform test determinations of state-designated Substance Use Disorder Health Professional Shortage Areas include:

- Colorado Health Systems Directory, Version 2.0. Colorado Department of Public Health and Environment
- Behavioral Health, United States, 2012; page 44 “Table 5. Past year substance use disorders among adults, by sex: percentage, United States, 2010-2011 combined”; row one “Any substance use disorder”
- National Comorbidity Survey - Replication; Minimally Adequate Treatment for

Substance Use Disorder

- United States Census Bureau, American FactFinder; American Community Survey, 2012-2016 5-year estimates, Table B21001
- United States Department of Veterans Affairs, Mental Health Benchmarks By Discipline
- Survey findings of the PCO derived from approximately 25,000 solicited responses of licensed behavioral health clinicians in the state of Colorado

These sources may be replaced by better quality analogous data sets as they become available in implementation of the final rule and future shortage assessments.



Variable catchment sizes for the two-step floating catchment area (2SFCA) method

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Primary care physician

ABSTRACT

Government efforts designed to help improve healthcare access rely on accurate measures of accessibility so that resources can be allocated to truly needy areas. In order to capture the interaction between physicians and populations, various access measures have been utilized, including the popular two-step floating catchment area (2SFCA) method. However, despite the many advantages of 2SFCA, the problems associated with using fixed catchment sizes have not been satisfactorily addressed. We propose a new method to dynamically determine physician and population catchment sizes by incrementally increasing the catchment until a base population and a physician-to-population ratio are met. Preliminary application to the ten-county region in northern Illinois has demonstrated that the new method is effective in determining the appropriate catchment sizes across the urban to suburban/rural continuum and has revealed greater detail in spatial variation of accessibility compared to results using fixed catchment sizes.

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1. Introduction

Despite its large per capita health expenditure, the U.S. falls behind other industrialized nations in key health performance measures (<http://www.who.int/whr/2000/en/index.html>). One of the primary reasons for this gap is the large disparities in both access to care and health outcomes. Access to primary healthcare is recognized as an important facilitator of overall population health and has remained a major goal of U.S. health legislation and government initiatives in past years. Access to healthcare (or healthcare accessibility) refers to the relative ease by which healthcare can be reached from a given location (Wang, in press) and is influenced by many factors, e.g., the supply of health services and physicians, the demand of patients (population) seeking care, the socio-economic and financial resources available to patients, and geographical impedances between patients and doctors (Aday and Andersen, 1974). Depending on whether the emphasis is on actual healthcare utilization versus service availability, or on spatial factors (such as geographic barriers) versus nonspatial factors (such as insurance), healthcare accessibility can be divided into four categories: potential spatial accessibility, potential non-spatial accessibility, revealed spatial accessibility, revealed non-spatial accessibility (Khan, 1992). The focus of this

paper will be on potential spatial accessibility measures and on demonstrating a new methodology.

Potential spatial access to medical services is primarily dependent on three factors: supply of medical services/physicians, population demand for the services, and travel costs between the demanding populations and medical sites (Wan et al., 2011). Various measures of spatial accessibility have been proposed, including regional availability (Khan, 1992), the gravity model (Joseph and Bantock, 1982) and the two-step floating catchment area (2SFCA) method (Luo and Wang, 2003). Of these methods, the regional availability method is the simplest to compute, as it is simply the ratio of supply (doctors) and demand (population) within a predefined area (e.g., administrative boundary). However regional availability measures do not reveal the spatial variation within the boundary, nor do they account for the interaction between supply and demand across the boundary. The gravity model is theoretically more sound, but it requires more computation and the result is not intuitive to interpret (Joseph and Phillips, 1984). The gravity model often takes the following form (Luo and Wang, 2003):

$$A_i^G = \frac{\sum_{j=1}^n S_j d_{ij}^{-\beta}}{\sum_{k=1}^m P_k d_{kj}^{-\beta}} \quad (1)$$

A_i^G is the gravity-based accessibility at population location i , where n and m are the total numbers of physician locations and population locations respectively. P_k is the population at location k , S_j the number of physicians at location j , and d_{kj} (or d_{ij}) the travel time between k and j (or i and j). The denominator term

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represents a measure of the availability of physicians at location j to all population ($P_k, k=1, 2, \dots, m$). β is the friction-of-distance coefficient, which has to be determined by physician–patient interaction data and is often region specific (Huff, 2000). The difficulty in determining β limits the wide application of the gravity model.

The 2SFCA method is a special case of the gravity model and thus not only keeps most of the advantages of a gravity model, but is also intuitive to interpret, as it generates essentially a special form of physician-to-population ratio (Luo and Wang, 2003). It is easily implemented in a GIS environment using the following two steps:

Step 1: For each physician location j , search all population locations (k) that are within a threshold travel time (d_0) from location j (this forms the catchment of physician location j or catchment j), and compute the physician-to-population ratio, R_j , within the catchment area:

$$R_j = \frac{S_j}{\sum_{k \in \{d_{ij} \leq d_0\}} P_k} \quad (2)$$

The variables are defined similarly as described above for the gravity model.

Step 2: For each population location i , search all physician locations (j) that are within the threshold travel time (d_0) from location i (that is, catchment area i), and sum up the physician-to-population ratios (derived in step 1), R_j , at these locations:

$$A_i^F = \sum_{j \in \{d_{ij} \leq d_0\}} R_j = \sum_{j \in \{d_{ij} \leq d_0\}} \frac{S_j}{\sum_{k \in \{d_{ij} \leq d_0\}} P_k} \quad (3)$$

where A_i^F represents the accessibility of population at location i to physicians based on the 2SFCA method. This is essentially a ratio of supply and demand and is thus straightforward to interpret.

The 2SFCA method has been used in a number of studies measuring healthcare accessibility (Yang et al., 2006; McGrail and Humphreys, 2009a,b; Dai, 2010; Schuurman et al., 2010; Dai, 2011; Dai and Wang, 2011; Ngui and Apparicio, 2011; Wan et al., 2011; Wang and Roisman, 2011). However, despite its relative popularity, at least three major limitations have been identified: (1) it is a dichotomous measure (i.e., all locations outside of the catchment are assumed to have no access at all); (2) it does not

consider distance decay within catchments (i.e., all locations inside of the catchment are assumed to have equal access, Luo and Qi, 2009); (3) it uses fixed catchment sizes (d_0) for all physician (supply) and population (demand) locations, and thus does not correctly reflect the reality that people in rural areas are willing to travel further distances and longer times to seek care than those in urban areas (i.e., the catchments in urban and rural areas should have different sizes, (McGrail and Humphreys, 2009b)). Several studies have attempted to improve upon these limitations. For example, a kernel density function (Guagliardo, 2004) or a Gaussian function (Dai, 2010) has been introduced to account for the distance decay effect in a continuous fashion. Different weights for different travel time zones have also been used to model the distance decay effects in a step-wise discrete fashion (Luo and Qi, 2009). Yang et al. (2006) suggested varying the catchment size based on provider types or neighborhood types. McGrail and Humphreys (2009b) introduced a cap function to limit the size of the catchment in urban areas. However, the debates on what functional form to choose and what proper catchment size to use still remain (Wang, in press). Inspired by a method used for determining the proper area for computing cancer incidence rate (Tiwari and Rushton, 2005), this paper proposes a new method for determining the physician and population catchment sizes of the 2SFCA method by incrementally increasing the catchment until a base population (BP) and a physician-to-population ratio (PPR) criteria are met (hereafter referred as the Variable 2SFCA method or V2SFCA). Preliminary application of the V2SFCA method to a ten-county region of northern Illinois around the Chicago area has shown that it dynamically finds the appropriate catchment sizes across the urban to suburban/rural continuum and reveals more details of spatial variation in accessibility compared to the previous 2SFCA using fixed catchment sizes.

2. Methodology

The new V2SFCA method for determining the catchment sizes follows a similar two-step procedure as the original 2SFCA to take into consideration the spatial interaction between physicians and populations (see Fig. 1 for a flow diagram).

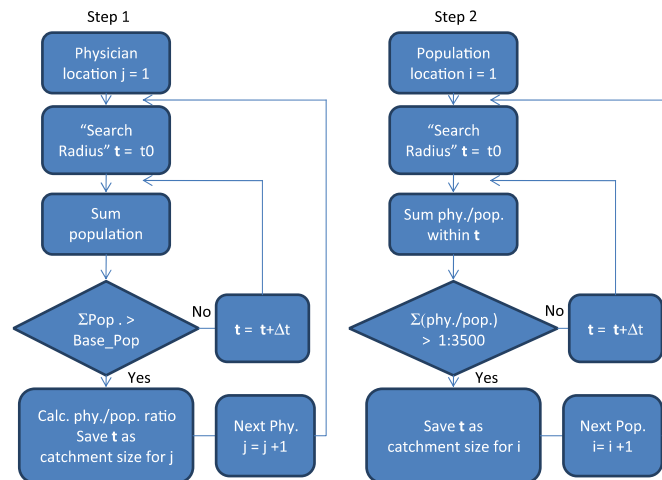


Fig. 1. Flow diagram of steps in determining variable catchment sizes for the 2SFCA method.

2.1. Variable service catchment size

In step 1, for each physician location, search all population locations (population-weighted census tract centroids) within a specified initial travel time t_0 (e.g., $t_0=10$ min) and sum the population. If the summed population is less than the BP threshold, the “search radius” time (or catchment size) is increased by a small increment Δt (e.g., $\Delta t=2$ min) and the process is repeated until the summed population reaches the BP threshold. The travel time at that point is considered the catchment size for that physician location. At this step, the PPR is also calculated and assigned to the physician location.

2.2. Variable population catchment size

In step 2, for each population location, search all physician locations within an initial travel time t_0 (e.g., $t_0=10$ min) and sum PPRs of these physician locations obtained from the first step. If the summed PPR is less than the predefined threshold, the time (or catchment size) is increased by a small increment Δt (e.g., $\Delta t=2$ min) and the process is repeated until the summed PPR exceeds the predefined threshold. The travel time at that point is set as the catchment size for that population location.

2.3. Distance decay function

Once these catchment sizes are determined, the 2SFCA method enhanced with distance decay function (Luo and Qi, 2009) is applied using these newly determined and spatially variable catchment sizes to find the spatial accessibility (i.e., replacing the fixed d_0 as described in Section 1).

Step 1: For each physician location j , search all population locations (k) that are within the catchment of physician location j (C_j), and compute the physician-to-population ratio, R_j , within the catchment area, discounted by distance decay function $f(d_{kj})$:

$$R_j = \frac{S_j}{\sum_{k \in \{d_{kj} \leq C_j\}} P_k f(d_{kj})} \tag{4}$$

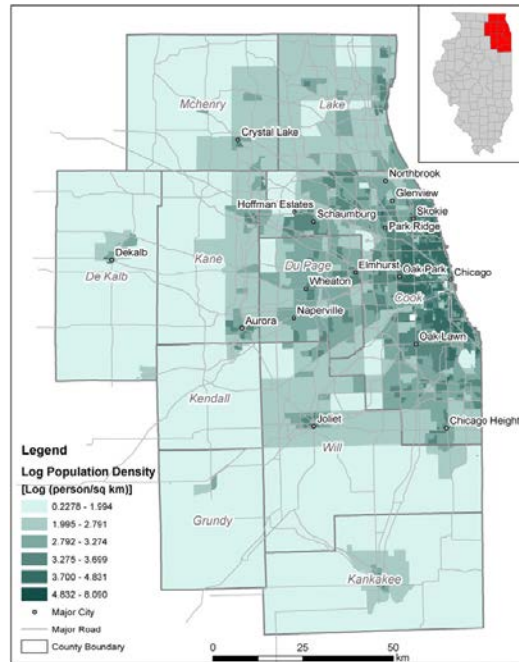
Step 2: For each population location i , search all physician locations (j) that are within the catchment area of population location i (C_i), and sum up the physician-to-population ratios (derived in step 1), R_j , at these locations, discounted by distance decay function $f(d_{ij})$:

$$A_i^F = \sum_{j \in \{d_{ij} \leq C_i\}} R_j f(d_{ij}) \tag{5}$$

In other words, there are a total of four steps in the whole process: two steps to determine the catchment sizes and two steps to calculate accessibility. These steps were implemented in a Fortran program. The travel time between origin–destination (OD) pairs only needs to be computed once.

3. Study area and data

To demonstrate the advantages of the V2SFCA method, it has been applied to examine the spatial accessibility to primary care physicians in a group of 10 primarily urban or suburban counties around Chicago in Northern Illinois: Cook, DeKalb, DuPage, Grundy, Kane, Kankakee, Kendall, Lake, McHenry, and Will (see Fig. 2). Since the focus of the paper is to demonstrate methodology, here we report results using 1990 data, which best illustrate the methodology. The population data were extracted from the 1990 Census Summary File 1. In addition to the summary files, the spatial coverages of census tracts and census blocks were generated using the 1990 Census TIGER/Line files. The population density by census tracts is shown in Fig. 2, which



	number of locations	Total
Population	1804	7,507,113
Physician	3990	7645

roughly represents the urban to suburban/rural continuum. Since portions of the study area are suburban/rural in nature with large census tracts, the population-weighted centroid has been used to represent the location of the population in lieu of the geographic centroid (Luo and Wang, 2003). The basic statistics of the population data are summarized in Table 1.

Primary care physician data of Illinois for 1989 were obtained from the Physician Masterfile of the American Medical Association (AMA) and were geocoded based on their office addresses with a matching rate of > 95% using an ArcGIS software. The 1989 data is up to date to December of 1989, and is a good representation of the 1990 data. Physicians practicing at the same location were dissolved into one point with the number of physicians at that location added as an attribute of that point. The basic statistics of the physician data are summarized in Table 1.

4. Calculation and parameters

4.1. Travel time

The travel time between each physician and population location can be calculated using the Origin–Destination (OD) Cost matrix function of ArcGIS Network Analyst Extension. Since this is

a computationally intensive process, to reduce computation time, we only computed pairs within 90 min of each other, which resulted in 4,306,699 OD pairs.

4.2. BP and PPR Thresholds

Conceptually, there needs to be some minimum population to support a doctor. This base population often fluctuates between rural and urban areas. In designating Health Professional Shortage Area (HPSA) and Medically Underserved Area or Population (MUA/P), US Department of Health and Human Services (DHHS) uses a 30-minute travel time and a physician-to-population ratio of 1:3500 as thresholds (see (Luo and Qi, 2009) for a brief review and <http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/index.html> for details). Following these practices, we used the average population within a 30-minute travel time around the physician locations as our guide to derive the BP threshold in step 1 (which is approximately 500,000 for the study area) and adopted 1:3500 as the PPR threshold in step 2. Of course, other values can be used depending on the specific situations or research contexts. The effects of using different threshold values will be discussed further in Section 6.

4.3. Distance decay functional form

For the purpose of illustrating methodology, we divided each catchment into three equal time zones (e.g., if a catchment is 45 min, then zone 1 is within 15 min, zone 2 from 15 to 30 min and zone 3 from 30 to 45 min) and adopted the simple stepwise Gaussian function to calculate the weights for the three zones (Kwan, 1998; Luo and Qi, 2009):

$$f(d_{ij}) = f(d_{kj}) = f(z) = \exp(-(z-1)^2 / \beta) \tag{6}$$

where z is the zone number and

$$z = \begin{cases} 1, & \text{if } 0 < d_{kj} \leq \frac{C_j}{3} \text{ or if } 0 < d_{ij} \leq \frac{C_j}{3} \\ 2, & \text{if } \frac{C_j}{3} < d_{kj} \leq \frac{2C_j}{3} \text{ or if } \frac{C_j}{3} < d_{ij} \leq \frac{2C_j}{3} \\ 3, & \text{if } \frac{2C_j}{3} < d_{kj} \leq C_j \text{ or if } \frac{2C_j}{3} < d_{ij} \leq C_j \end{cases} \tag{7}$$

Here we used $\beta=1.15$ and obtained the following weights to calculate the spatial accessibility values following the steps described above:

$$W_{kj} \text{ or } W_{ij} = \begin{cases} 1, & \text{if } d_{kj} \text{ or } d_{ij} \in \text{zone 1} \\ 0.42, & \text{if } d_{kj} \text{ or } d_{ij} \in \text{zone 2} \\ 0.03, & \text{if } d_{kj} \text{ or } d_{ij} \in \text{zone 3} \end{cases} \tag{8}$$

Under this implementation, Eqs. (4) and (5) become (note the weights are applied to both steps):

$$R_j = \frac{S_j}{\sum_{k \in (d_{ij} \leq C_j)} P_k W_{kj}} \tag{9}$$

$$A_i^F = \sum_{j \in (d_{ij} \leq C_i)} R_j W_{ij} \tag{10}$$

For comparison, we also computed the accessibility using fixed 30-minute catchment sizes and the same distance decay weights for 3 zones. In other words, the only difference here is in the catchment size. Since data outside of the study area was not included in the calculation, caution needs to be exercised in the interpretation of results near the edge of the study area.

5. Results

Table 2 shows the basic statistics of the physician and population catchment sizes using the following parameter values:

BP=500,000 and PPR=1:3500. This serves as our base case for discussion. The physician catchment size ranges from 14 to 86 min with a mean of 30 min and a standard deviation of 11 min. The population catchment sizes are generally smaller than the physician catchment sizes, ranging from 10 to 68 min with a mean of 21 min and a standard deviation of 11 min. As the physicians are often located in urban centers, they are expected to have larger catchment sizes because they will likely serve surrounding rural populations. On the other hand, population catchment sizes are smaller because urban populations are less likely to seek care in more rural areas (McGrail and Humphreys, 2009b). The spatial distribution of both physician and population catchment sizes are shown in Fig. 3 as circles of different sizes. The catchment sizes for both physician and population locations are smaller in urban areas and larger in suburban/rural areas because there are more doctors available in urban areas, causing people in suburban/rural areas to travel further distances and longer times to obtain care. This catchment size distribution correctly reflects the reality.

Fig. 4 compares the spatial distribution of accessibility scores in the study area using the fixed catchment size of 30-minutes for both physician and population locations and using the variable catchment sizes determined by the new method shown in Fig. 3. Note that distance decay has been considered in both cases using step-wise Gaussian weights of (1.00, 0.42, 0.03; Luo and Qi, 2009) and the only difference is in the catchment sizes. From this case study it is clear that the fixed catchment size method tends to overestimate the accessibility, in both urban and suburban/rural areas, as compared to the variable catchment method. This is the case because urban populations typically do not have to travel 30 min to find adequate numbers of primary care physicians. By using a fixed 30-minute catchment size, the number of physicians available to these populations may have been overestimated. On the other hand, physicians in rural areas often have to serve a larger area and by limiting the catchment size to a fixed 30 min, the population they serve is underestimated, leading to a higher accessibility score. Overall, the V2SFCA method has resulted in more detailed spatial variation of accessibility in urban areas. The high accessibility areas are mostly located around the major towns/cities, e.g., Aurora, Chicago Heights, Elmhurst, Joliet, Naperville, Oak Lawn, and Wheaton (see Figs. 2 and 4). The results using the V2SFCA method thus are more logical and consistent with what we know about physician utilization patterns in urban and rural settings as compared to those of the fixed catchment method. To better compare the two results, accessibility scores by census tract have been plotted in Fig. 5, confirming that the fixed size method overestimates accessibility for nearly all of the tracts as compared to the new method.

Table 2
Basic statistics of the dynamically determined population and physician catchments (measured in travel time in minutes) using different values for base population (BP) and physician-to-population ratio (PPR).

BP	PPR		Min.	Max.	Avg.	Std. Dev.
500,000	1:3500	Physician	14	86	30.02	11.10
		Population	10	68	20.85	11.18
700,000	1:3500	Physician	18	90	34.93	12.37
		Population	10	74	23.29	12.72
380,000	1:3500	Physician	12	74	26.60	10.04
		Population	10	64	19.14	10.10
500,000	1:3000	Physician	14	86	30.02	11.10
		Population	10	70	21.97	11.87
500,000	1:4000	Physician	14	86	30.02	11.10
		Population	10	68	19.91	10.63

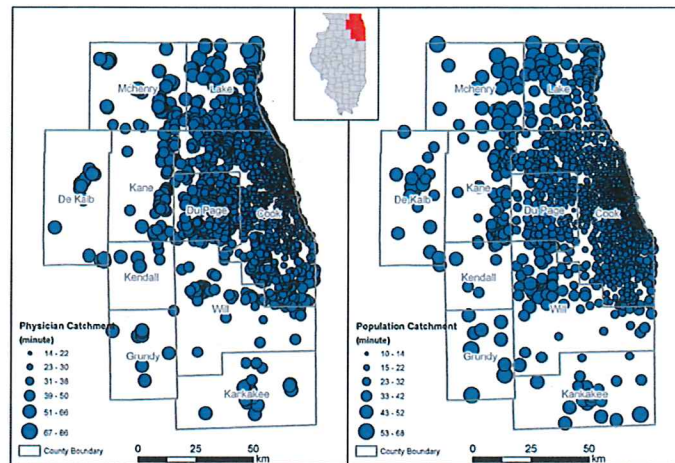


Fig. 3. Catchment sizes for physician locations and population locations. The different size circles are symbols representing different catchment sizes.

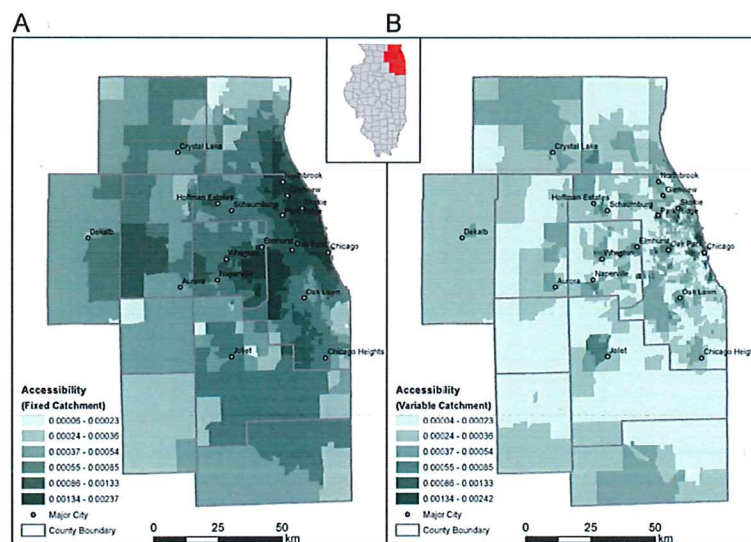


Fig. 4. Spatial distribution of accessibility scores using the fixed catchment size 2SFCA method (A) and the variable catchment size 2SFCA method (B). Note the legends have the same divisions except for the upper and lower limits.

For the more rural areas, we will only examine the counties of Kane and Will, because they are located in the interior of the study area and should be devoid of any edge effect mentioned earlier. From the population density map (Fig. 2), it is evident that the western half of Kane and southern half of Will counties are more rural. However, the fixed catchment size method shows higher accessibility values in those locations, which is counter-intuitive and may reflect more “choices” of physicians in nearby towns rather than actual access to those physicians (McGrail and Humphreys, 2009b). In contrast, the variable catchment size method correctly shows higher accessibilities in the eastern half of Kane and northern half of Will counties, particularly around the population centers of Aurora and Joliet.

6. Discussion

6.1. Parameter sensitivity tests

The V2SFCA method requires the inclusion of two thresholds, BP (for step 1) and PPR (for step 2), both of which can be easily incorporated into the current practices in physician shortage designation. By referencing the 30-minute travel time for defining a rational service area adopted by DHHS, we derived the BP threshold using the mean of populations within 30-minute travel time of all physician locations as our guide. For the application of this method in rural areas, we can derive the BP threshold based on the mean of populations around a larger travel time

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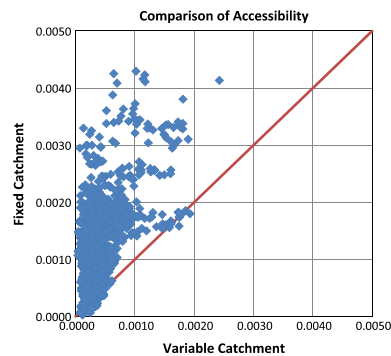


Fig. 5. Comparison of accessibility between fixed catchment and variable catchment methods. The red line is the 1:1 line. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

(e.g., 60-minutes) of the physician locations. To test the sensitivity of using different BP thresholds on the final accessibility result, we used two different values: 380,000 and 700,000. The spatial patterns of the results are consistent with those shown in Fig. 4B, again revealing much more detailed spatial distribution within urban areas and more intuitively reasonable patterns in rural areas as compared to results using the fixed catchment size method. The large BP threshold tends to result in large catchment sizes (see Table 2) and lower accessibility scores, especially for high accessibility areas (urban centers). This is clearly shown in Fig. 6A, where high accessibility tracts using BP threshold of 700,000 are plotted below the tracts using a BP threshold of 500,000. For these urban centers, the use of a large BP threshold means the catchment will likely expand into rural areas. As such, more rural populations will be included in the catchment, but since there are not many physicians in rural areas, a lower physician to population ratio and lower accessibility score will result (Fig. 6A). The spatial patterns of the differences between accessibilities using different BP thresholds (not shown) confirm the above observation. The reverse is true when using a smaller BP (380,000) (see Table 2 and Fig. 6A).

For the PPR threshold (in step 2), we simply adopted the DHHS's standard 1:3500 ratio used for defining rational service area for physician shortage area designation. To test the sensitivity of using different PPR thresholds on the final accessibility result, we calculated results using two thresholds: 1:4000 and 1:3000 while keeping other parameters the same as in Fig. 4. The spatial patterns of accessibility using higher and lower PPR thresholds are again similar to the results shown in Fig. 4B. Since the BP threshold is kept the same, the physician catchment size is also the same (Table 2). A larger PPR threshold (1:3000) generally resulted in a larger population catchment size (Table 2). Fig. 6B shows that for tracts with lower accessibility (rural areas), a larger PPR (1:3000) resulted in higher accessibility than a smaller PPR (1:3500). For these rural populations, as catchment size is increased to satisfy the large PPR threshold, the catchments tend to expand into urban areas and include more physician locations, thus resulting in higher accessibility. (A similar phenomenon can also be observed for some low accessibility tracts in Fig. 6A for the same reasons.) The reverse is true for the case using a smaller PPR threshold (1:4000). It is interesting to note that for high accessibility points (urban centers) in Fig. 6B, there is virtually no difference in accessibilities from using different PPR thresholds. This is because for these urban centers, expanding the catchment

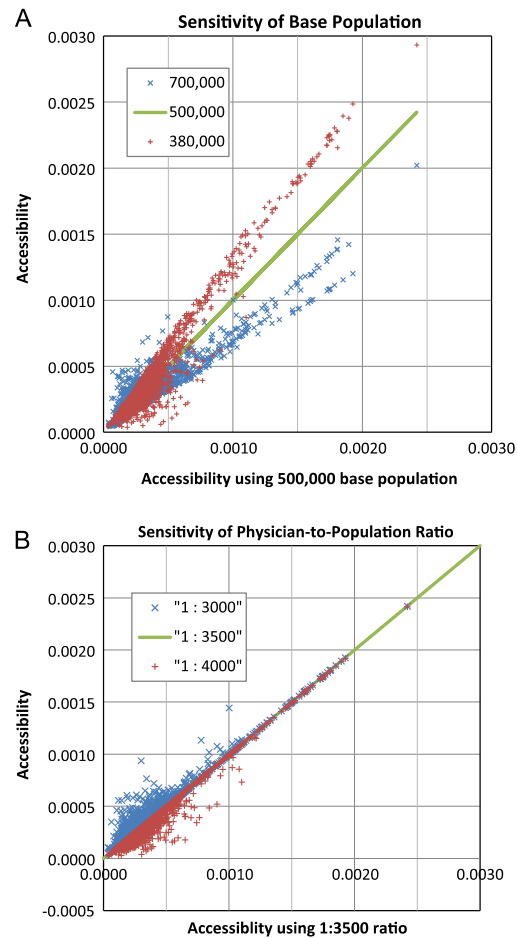


Fig. 6. (A) Effect of different base population (BP) on accessibility result (keeping PPR in step 2 at 1:3500). (B) Effect of different physician-to-population ratio (PPR) on accessibility result (keeping BP in step 1 at 500,000).

size into rural areas will unlikely gain any more physician locations. The spatial patterns of the differences between accessibilities using different PPRs (not shown) confirm the above observation.

6.2. Distance decay functional form

As discussed in Wang (in press), other distance decay function forms, such as a continuous function (gravity function or Gaussian function), a discrete step-wise function (this paper), or a hybrid function form of the previous two, can be easily incorporated into the new methodology. Luo and Wang (2003) showed that 2SFCA is a special case of gravity model. Recently, Shi et al. (in press) has demonstrated that 2SFCA, gravity model, and kernel density estimator are inherently related. They argued that the different functional forms for determining distance decay weight will not significantly impact the spatial pattern of the estimates, which is a well-accepted conclusion in the kernel density estimation study (Silverman, 1986).

6.3. Policy implications

The fixed catchment size 2SFCA (even with distance decay incorporated) tends to overestimate the accessibility and may result in missing the truly underserved areas. As pointed out before, some of the higher accessibility score in rural areas between towns occurs because the method is measuring more “choices” of physicians in nearby towns rather than actual access to those physicians (McGrail and Humphreys, 2009b). Using the new V2SFCA method would address this problem and allow most efficient and effective use of limited resources to the neediest population in rural areas. In addition, since the BP and PPR thresholds can be easily related to the current practices of physician shortage designation, this method can be readily incorporated into the existing physician shortage area designation methods.

7. Summary

Despite the many advantages of the original 2SFCA method in measuring potential access to primary care, the exclusion of distance decay and the choice of a single constant catchment size greatly limits its potential in certain scenarios, especially in rural areas (McGrail and Humphreys, 2009b). The distance decay issue has been addressed by using a continuous kernel density function (Guagliardo, 2004) or a Gaussian function (Dai, 2010) or using step-wise discrete weights (Luo and Qi, 2009). The major contribution of this paper is to address the issue of fixed catchment size. We introduced an innovative method in determining catchment sizes using the same principle of 2SFCA that considers both demand and supply and dynamically determines the size across the urban, suburban, and rural continuum. Although two thresholds (BP and PPR) are introduced, they can be easily related to existing practices of physician shortage designation. The result of applying this method in the Chicago region has revealed much more detailed variation of spatial accessibility in urban areas. In addition, the spatial accessibility patterns in rural areas are more consistent with intuition, showing the highest accessibility around major cities, which makes more practical sense. Sensitivity tests show that the spatial accessibility from the V2SFCA method in urban areas tends to be more sensitive to BP threshold while that in rural areas tends to be more sensitive to PPR threshold.

We believe the new V2SFCA method we introduced here offers a practical way of determining the proper catchment sizes for both physician and population locations. Since the BP and PPR thresholds can be easily related to the current practices of physician shortage designation, this method can be easily incorporated into existing physician shortage area designation methods.

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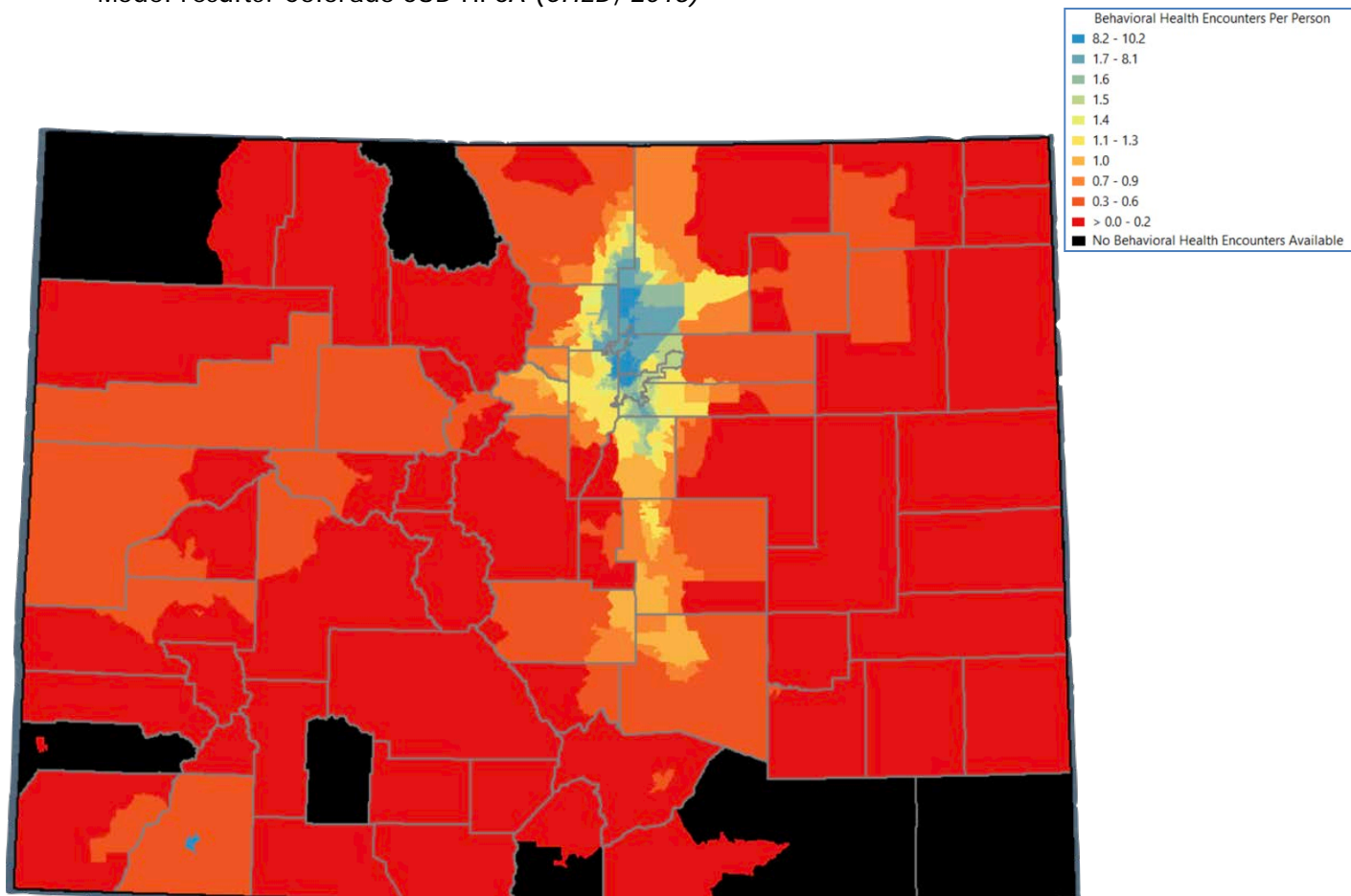
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Sample Model Results
State-Designated Substance Use Disorder Health Professional Shortage Areas (SUD-HPSA)
by Decile in Colorado
 (Center for Health and Environmental Data (CHED), 2018)

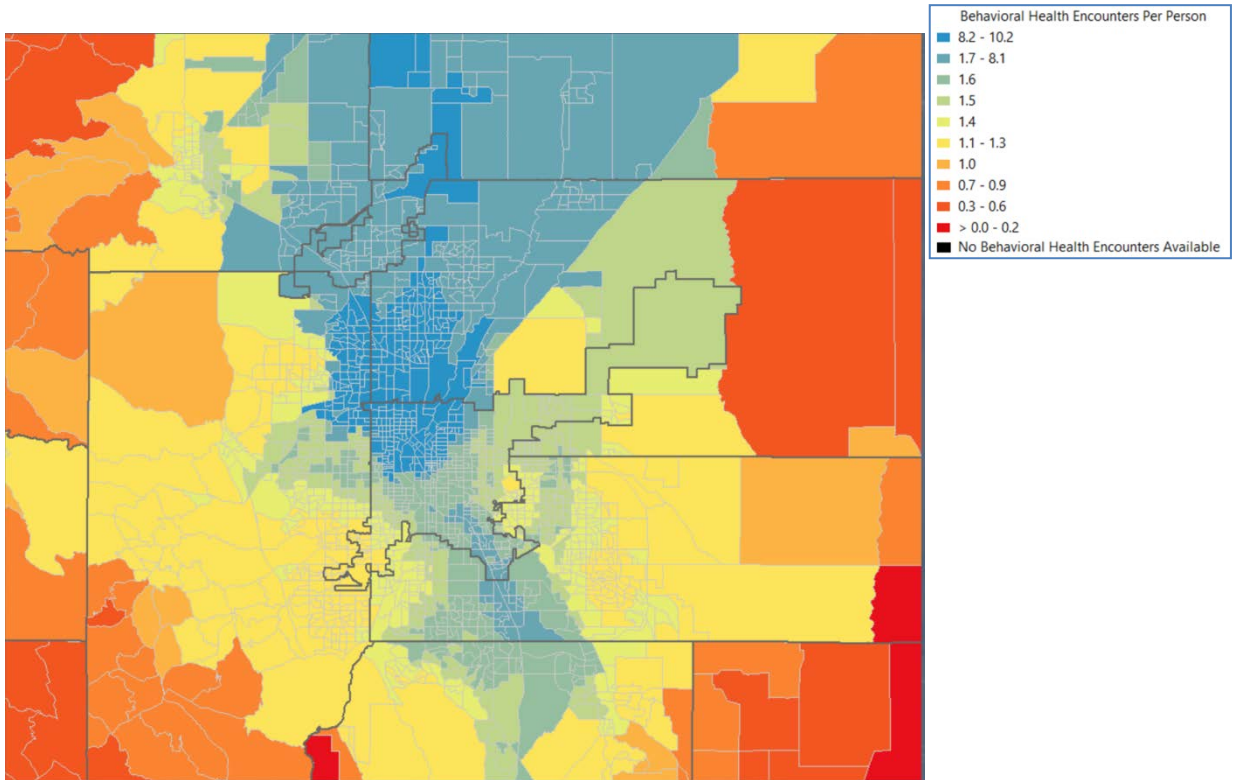
These maps are test results of the methodology with available data at the time of analysis. The following are GIS maps that represent the number of SUD treatment services encounters available to resident civilian males and females ages 18 and above who are experiencing an episode of SUD using the methodology communicated in the rule and described in the Statement of Basis and Purpose.

The map reflects the number of SUD treatment services encounters available to residents ages 18 and above within each Census Block Group based on the two-step floating catchment area methodology, binned by decile. Each decile bin contains 353 census block groups (3,532/10). Census block groups that are not blue fall below an estimated provider capacity of eight visits per person affected by SUD. These areas of the state may receive formal designation as a SUD-HPSA under these proposed rules.

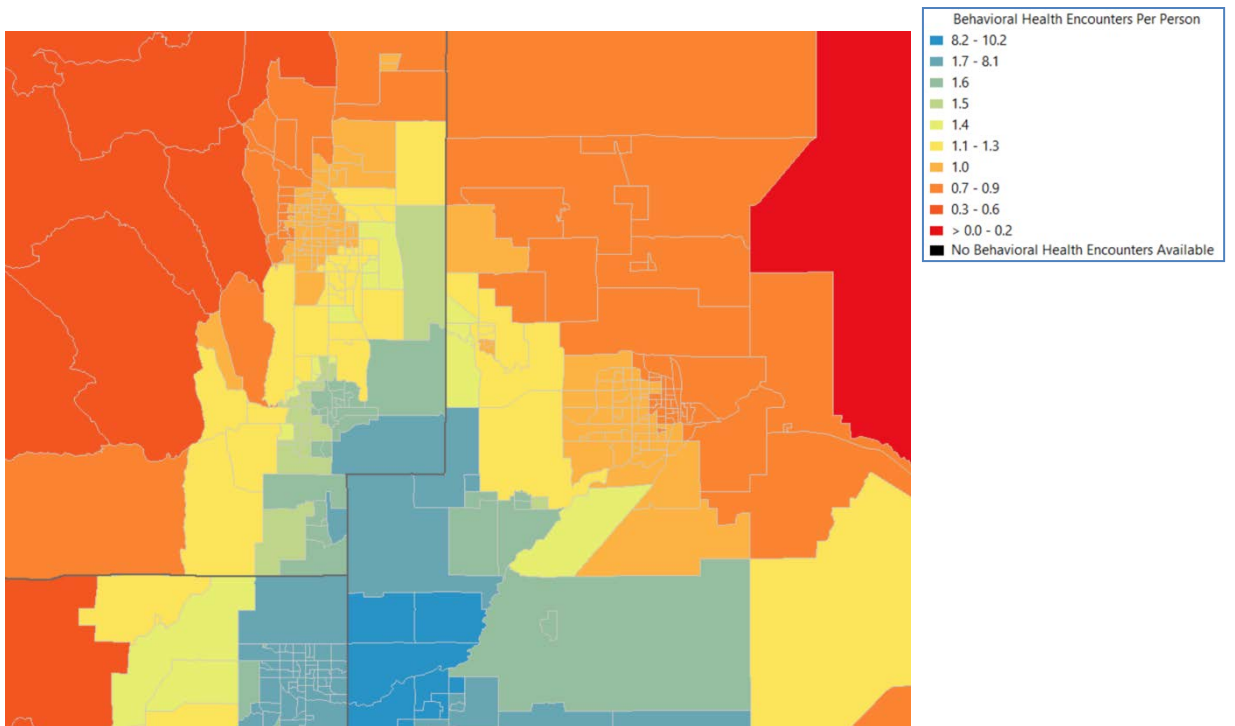
Model results: Colorado SUD HPSA (CHED, 2018)



Model results: Denver metro SUD HPSA detail (CHED, 2018)



Model results: Fort Collins, Greeley, Loveland SUD HPSA detail (CHED, 2018)



STAKEHOLDER ENGAGEMENT

6 CCR 1015-6, State-Designated Health Professional Shortage Area Methodology

State law requires agencies to establish a representative group of participants when considering to adopt or modify new and existing rules. This is commonly referred to as a stakeholder group.

Early Stakeholder Engagement:

The following individuals and/or entities were invited to provide input and included in the development of these proposed rules:

State Government

Organization	Representative
Department of Health Care Policy and Financing <ul style="list-style-type: none"> Compliance & Stakeholder Relations Executive Leadership Team 	Kimberly Smith, Compliance & Stakeholder Relations Unit Manager; Michelle Miller, Chief Nursing Officer, Client & Clinical Care Office; Melissa Eddleman, Behavioral Health Unit Manager
Department of Human Services: Office of Behavioral Health	Camille Harding, Division Director of Community and Behavioral Health- Office of Behavioral Health; Claudia Zundel, Director of Child Adolescent and Family Services; Janet Steinkamp, OBH-SIM Project Manager; Mary McMahon, Manager CAC Clinical Training Program; Linda Martin, State Targeted Response Treatment Manager
Department of Public Health and Environment <ul style="list-style-type: none"> Center for Health and Environmental Data: GIS Unit 	Devon Wilford, Health and Geographic Information System Integration; Ben White, GIS

<ul style="list-style-type: none"> ● Community Health Division <ul style="list-style-type: none"> ○ Office of Emergency Preparedness and Response ○ Office of Planning and Partnerships ● Executive Director's Office ● Health Facilities Division ● Prevention Services Division <ul style="list-style-type: none"> ○ Children Youth and Families Branch (Maternal and Child Health) ○ Healthy Connections Branch (School Based Health Programs) ○ Violence and Injury Prevention Mental Health Promotion Branch (Opioid Overdose Prevention Program) 	<p>Health Analyst</p> <p>Curt Drennen, Psy.D., Branch Supervisor Health and Safety Unit; Anne-Marie Braga, Director of Local Public Health Partnerships</p> <p>Tista Ghosh, MD, Director, Public Health Programs and Deputy Chief Medical Officer</p> <p>Randy Kuykendall, Health Facilities Division Director Kara Johnson-Hufford, Branch Chief Health Facility Quality Branch</p> <p>Elizabeth Whitley, Ph.D., Prevention Services Division Director Rachel Hutson, Branch Chief Children, Youth and Families Branch</p> <p>Kristina Green, SBIRT School-Based Health Center Project Coordinator</p> <p>Lindsey Myers, Branch Chief Violence and Injury Prevention-Mental Health Promotion Branch; Maria Butler, Prescription Drug Epidemiologist; Allison Rosenthal, Prescription Drug Overdose Project Evaluator Christina Mickle Toxicology Reviewer</p>
<p>Department of Public Safety</p>	<p>Peggy Heil, Office of Research and Statistics Division of</p>

	Criminal Justice
Department of Regulatory Agencies <ul style="list-style-type: none"> • Division of Insurance • Division of License and Registration 	Adam Boggess, Interim Director Rates and Forms/ Life, Accident and Health; Shirley Taylor, Rates and Forms/ Life, Accident and Health; Jo Donlin, Director of Regulatory Outreach and Education
Office of the Governor: State Innovation Model Office	Barbara Martin, Director, SIM; Shilynn Coleman, SIM Workforce and Population Health Program Manager

Federal Government

Organization	Representative
Health Resources and Services Administration (Region 8)	Kim Patton, Psy.D., Public Health Analyst/ Behavioral Health Liaison
Substance Abuse Mental Health Services Administration (Region 8)	Charles Smith, Ph.D., Regional Administrator Region VIII

Non-governmental Partners

Organization	Representative
Center for Improving Value in Health Care	Jonathan Mathieu, Ph.D., Vice President of Research & Compliance and Chief Economist; Maria de Jesus Diaz, Quality Measures Program Manager
Colorado Association of Addiction Professionals	Mita Johnson, Ed.D., Member of the Board
Colorado Association of Local Public Health Officials	Tracy Anselmo, Executive Director

Colorado Behavioral Health Care Council	Moses Gur, Director of Policy and Member Engagement; Emily Haller, SIM Program Coordinator
Colorado Community Health Network	Suzanne Smith, Health Center Operations Director; Victoria Anderson Senior Quality Initiatives Manager
Colorado Consortium on Prescription Drug Abuse Prevention	Whit Olyer, Strategic Planning Coordinator
Colorado Criminal Justice Reform Coalition	Terri Hurst, Policy Coordinator
Colorado Medical Society	Chet Seward, Senior Director, Division of Health Care Policy
Colorado Providers Association	Jennifer Miles, Public Affairs Consultant, Frontline
Colorado Psychological Association	Jeannie Vanderburg, Public Affairs Consultant, Capstone
Colorado Rural Health Center	Michelle Mills, Chief Executive Officer
Mental Health Colorado	Moe Keller, Vice President of Public Policy and Strategic Initiatives
National Council for Behavioral Health	Mindy Klowden, Director Training and Technical Assistance
The Steadman Group	J.K. Costello, MD, Senior Consultant
University of Denver, Graduate School of Social Work	Michael Talamantes, MSW, Clinical Associate Professor
Wellbeing Trust	Benjamin Miller, PsyD., Chief Strategy Officer

Stakeholder meetings have been ad hoc and one-on-one though the development of this request for rulemaking packet.

Stakeholder Group Notification

The stakeholder group was provided notice of the rulemaking hearing and provided a copy of the proposed rules or the internet location where the rules may be viewed. Notice was provided prior to the date the notice of rulemaking was published in the Colorado Register (typically, the 10th of the month following the Request for Rulemaking).

- Not applicable. This is a Request for Rulemaking Packet. Notification will occur if the Board of Health sets this matter for rulemaking.
- Yes.

Summarize Major Factual and Policy Issues Encountered and the Stakeholder Feedback Received. If there is a lack of consensus regarding the proposed rule, please also identify the Department's efforts to address stakeholder feedback or why the Department was unable to accommodate the request.

No major factual or policy issues were encountered during the preparation of this Rulemaking Packet. No local government mandate or impact is anticipated.

Overall, after considering the benefits, risks and costs, the proposed rule:

Select all that apply.

✓	Improves behavioral health and mental health; or, reduces substance abuse or suicide risk.	✓	Reduces or eliminates health care costs, improves access to health care or the system of care; stabilizes individual participation; or, improves the quality of care for unserved or underserved populations.
✓	Improves housing, land use, neighborhoods, local infrastructure, community services, built environment, safe physical spaces or transportation.	✓	Reduces occupational hazards; improves an individual's ability to secure or maintain employment; or, increases stability in an employer's workforce.
	Improves access to food and healthy food options.		Reduces exposure to toxins, pollutants, contaminants or hazardous substances; or ensures the safe application of radioactive material or chemicals.
✓	Improves access to public and environmental health information; improves the readability of the rule; or, increases the shared understanding of roles and responsibilities, or what occurs under a rule.	✓	Supports community partnerships; community planning efforts; community needs for data to inform decisions; community needs to evaluate the effectiveness of its efforts and outcomes.
	Increases a child's ability to participate in early education and educational opportunities through prevention efforts that increase protective factors and decrease risk factors, or stabilizes individual participation in the opportunity.		Considers the value of different lived experiences and the increased opportunity to be effective when services are culturally responsive.
✓	Monitors, diagnoses and investigates health problems, and health or environmental hazards in the community.	✓	Ensures a competent public and environmental health workforce or health care workforce.
	Other: _____ _____		Other: _____ _____

An Act

SENATE BILL 18-024

BY SENATOR(S) Jahn and Tate, Aguilar, Lambert, Priola, Court, Crowder, Fields, Garcia, Guzman, Jones, Kefalas, Kerr, Martinez Humenik, Merrifield, Moreno, Todd, Williams A., Zenzinger;
also REPRESENTATIVE(S) Singer and Pettersen, Kennedy, Arndt, Bridges, Esgar, Exum, Ginal, Gray, Herod, Hooton, Jackson, Kraft-Tharp, Lee, Lontine, Melton, Michaelson Jenet, Salazar, Weissman, Winter, Young, Duran.

CONCERNING MODIFICATIONS TO THE COLORADO HEALTH SERVICE CORPS PROGRAM ADMINISTERED BY THE DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT TO EXPAND THE AVAILABILITY OF BEHAVIORAL HEALTH CARE PROVIDERS IN SHORTAGE AREAS IN THE STATE, AND, IN CONNECTION THEREWITH, MAKING AN APPROPRIATION.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Legislative declaration. (1) The general assembly finds and determines that:

(a) Colorado faces a health care workforce shortage in many health care areas, including a shortage in behavioral health care providers who work with patients with mental health and substance use disorders;

Capital letters or bold & italic numbers indicate new material added to existing statutes; dashes through words indicate deletions from existing statutes and such material not part of act.

(b) With an opioid epidemic and increasing overdose rates affecting all corners of the state, the need for health professionals who can treat patients with substance use disorders is particularly acute;

(c) Additionally, providers who seek to hire mental health and substance use disorder professionals report difficulty in filling positions, leading to reduced services despite having the physical space for beds or outpatient treatment rooms;

(d) The state currently operates a loan repayment program, known as the Colorado health service corps, that targets the need for primary care services in health professional shortage areas throughout the state by providing loan repayment to a health care professional who commits to practicing and providing primary care in a shortage area for a minimum period;

(e) The Colorado health service corps program, in its current form, is limited to specific providers providing primary or psychiatric care in areas of the state designated as health professional shortage areas under federal guidelines;

(f) Further, the existing loan repayment program is available only to providers who have already obtained a license, which can require at least one to two years of supervised practice, depending on the license type, after completion of a master's or doctorate degree, yet the need for assistance with repaying student loans is often greatest during this supervised practice period since salary earnings are lower;

(g) While the current program requirements are well suited for providing greater access to primary and psychiatric care, they do not address the increasing demand for behavioral health care services to treat other mental health or substance use disorders and the financial burdens faced by candidates for licensure who are progressing to licensure but are not eligible for loan repayment and are often working at an entry-level salary;

(h) Moreover, the federal guidelines for determining a health professional shortage area do not adequately measure the shortage of other mental health or substance use disorder professionals in areas of the state experiencing an increased need for behavioral health care services;

(i) In order to expand access to behavioral health care providers and behavioral health care services in areas of the state where the need for behavioral health care is great and the access to care is limited, it is important to:

(I) Allow behavioral health care providers and candidates for licensure as a behavioral health care provider to participate in the loan repayment program through the Colorado health service corps to provide incentives to those providers and candidates to deliver behavioral health care services in health professional shortage areas in the state and to ease the financial burdens they face when practicing in health professional shortage areas;

(II) Establish a scholarship program to provide financial assistance to addiction counselors seeking initial or a higher level of certification to defray education and training costs in exchange for a commitment to provide behavioral health care services in health professional shortage areas;

(III) Allow the primary care office, under guidelines adopted by the state board of health, to designate health professional shortage areas in the state using state-specific guidelines rather than federal guidelines;

(IV) Add representatives of substance use disorder service providers to the advisory council that reviews and makes recommendations on loan repayment applications; and

(V) Dedicate an amount of money from the marijuana tax cash fund to provide loan repayment to behavioral health care providers and candidates for licensure and scholarships to addiction counselors in order to expand access to behavioral health care services to individuals suffering from a mental health or substance use disorder.

(2) The general assembly further finds that expanding access to the health care professional loan repayment program to behavioral health care providers will expand access to behavioral health care services and treatment for people with mental health or substance use disorders, and therefore, the use of retail marijuana tax revenues to fund loan repayments for behavioral health care providers under the Colorado health service corps program is authorized under section 39-28.8-501 (2)(b)(IV)(C), C.R.S.

SECTION 2. In Colorado Revised Statutes, 25-1.5-402, **add** (11) as follows:

25-1.5-402. Definitions. As used in this part 4, unless the context otherwise requires:

(11) "STATE-DESIGNATED HEALTH PROFESSIONAL SHORTAGE AREA" MEANS AN AREA OF THE STATE DESIGNATED BY THE PRIMARY CARE OFFICE, IN ACCORDANCE WITH STATE-SPECIFIC METHODOLOGIES ESTABLISHED BY THE STATE BOARD BY RULE PURSUANT TO SECTION 25-1.5-404 (1)(a), AS EXPERIENCING A SHORTAGE OF HEALTH CARE PROFESSIONALS OR BEHAVIORAL HEALTH CARE PROVIDERS.

SECTION 3. In Colorado Revised Statutes, 25-1.5-404, **amend** (1)(a) as follows:

25-1.5-404. Primary care office - powers and duties - rules. (1) The primary care office has, at a minimum, the following powers and duties:

(a) To assess the health care AND BEHAVIORAL HEALTH CARE professional needs of areas throughout the state AND CREATE AND ADMINISTER STATE-DESIGNATED HEALTH PROFESSIONAL SHORTAGE AREAS IN ACCORDANCE WITH STATE BOARD RULES ADOPTED UNDER THIS SUBSECTION (1)(a) ESTABLISHING STATE-SPECIFIC METHODOLOGIES FOR DESIGNATING AREAS EXPERIENCING A SHORTAGE OF HEALTH CARE PROFESSIONALS OR BEHAVIORAL HEALTH CARE PROVIDERS. THE PRIMARY CARE OFFICE SHALL COORDINATE WITH THE DEPARTMENT OF HEALTH CARE POLICY AND FINANCING IN DEVELOPING THE HEALTH PROFESSIONAL SHORTAGE AREA DESIGNATION METHODOLOGIES AND IN DRAFTING RULES UNDER THIS SUBSECTION (1)(a).

SECTION 4. In Colorado Revised Statutes, **amend** 25-1.5-501 as follows:

25-1.5-501. Legislative declaration. (1) The general assembly hereby finds that there are areas of Colorado that suffer from a lack of health care professionals OR BEHAVIORAL HEALTH CARE PROVIDERS to serve, and a lack of nursing or other health care professional faculty to train health care professionals to meet, the medical AND BEHAVIORAL HEALTH CARE

needs of communities. The general assembly further finds that the state needs to implement incentives to encourage health care professionals AND BEHAVIORAL HEALTH CARE PROVIDERS to practice in these underserved areas and to encourage nursing faculty and other health care professional faculty to teach these health care professionals.

(2) It is therefore the intent of the general assembly in enacting this part 5 to create a state health service corps program that uses state moneys MONEY, federal moneys MONEY, when permissible, and contributions from communities and private sources to help repay the outstanding education loans that many health care professionals, BEHAVIORAL HEALTH CARE PROVIDERS, CANDIDATES FOR LICENSURE, nursing faculty, and health care professional faculty hold. In exchange for repayment of loans incurred for the purpose of obtaining education in their chosen health care AND BEHAVIORAL HEALTH CARE professions, the health care professionals, BEHAVIORAL HEALTH CARE PROVIDERS, AND CANDIDATES FOR LICENSURE will commit to provide health care OR BEHAVIORAL HEALTH CARE services, AS APPLICABLE, in communities with underserved health care OR BEHAVIORAL HEALTH CARE needs throughout the state, and the nursing and health care professional faculty will commit to providing a specified period of service in a qualified faculty position.

(3) IN ADDITION, FOR PURPOSES OF INCREASING THE AVAILABILITY OF CERTIFIED ADDICTION COUNSELORS, IT IS THE INTENT OF THE GENERAL ASSEMBLY TO CREATE A SCHOLARSHIP PROGRAM TO PROVIDE SCHOLARSHIPS TO ADDICTION COUNSELORS WHO, IN EXCHANGE FOR RECEIVING SCHOLARSHIPS TO ASSIST THEM IN OBTAINING THE REQUIRED EDUCATION AND TRAINING TO BE CERTIFIED AS AN ADDICTION COUNSELOR, COMMIT TO PRACTICE IN A HEALTH PROFESSIONAL SHORTAGE AREA FOR A SPECIFIED PERIOD.

SECTION 5. In Colorado Revised Statutes, 25-1.5-502, **add** (1.3), (1.5), (1.7), (6.5), (12), (13), and (14) as follows:

25-1.5-502. Definitions. As used in this part 5, unless the context otherwise requires:

(1.3) "BEHAVIORAL HEALTH CARE PROVIDER" MEANS THE FOLLOWING PROVIDERS WHO PROVIDE BEHAVIORAL HEALTH CARE SERVICES WITHIN THEIR SCOPE OF PRACTICE:

- (a) A LICENSED ADDICTION COUNSELOR;
 - (b) A CERTIFIED ADDICTION COUNSELOR;
 - (c) A LICENSED PROFESSIONAL COUNSELOR;
 - (d) A LICENSED CLINICAL SOCIAL WORKER;
 - (e) A LICENSED MARRIAGE AND FAMILY THERAPIST;
 - (f) A LICENSED PSYCHOLOGIST;
 - (g) A LICENSED PHYSICIAN ASSISTANT WITH SPECIFIC TRAINING IN SUBSTANCE USE DISORDERS;
 - (h) AN ADVANCED PRACTICE NURSE WITH SPECIFIC TRAINING IN SUBSTANCE USE DISORDERS, PAIN MANAGEMENT, OR PSYCHIATRIC NURSING; OR
 - (i) A PHYSICIAN WITH SPECIFIC BOARD CERTIFICATION OR TRAINING IN ADDICTION MEDICINE, PAIN MANAGEMENT, OR PSYCHIATRY.
- (1.5) "BEHAVIORAL HEALTH CARE SERVICES" MEANS SERVICES FOR THE PREVENTION, DIAGNOSIS, AND TREATMENT OF, AND THE RECOVERY FROM, MENTAL HEALTH AND SUBSTANCE USE DISORDERS.
- (1.7) "CANDIDATE FOR LICENSURE" MEANS A PERSON WHO:
- (a) IS A CANDIDATE FOR A LICENSE AS A LICENSED PSYCHOLOGIST, CLINICAL SOCIAL WORKER, MARRIAGE AND FAMILY THERAPIST, LICENSED PROFESSIONAL COUNSELOR, OR ADDICTION COUNSELOR;
 - (b) HAS COMPLETED A MASTER'S DEGREE OR, FOR A PSYCHOLOGIST LICENSURE CANDIDATE, HAS COMPLETED A DOCTORAL DEGREE;
 - (c) HAS NOT YET COMPLETED THE SUPERVISED EXPERIENCE HOURS REQUIRED FOR LICENSURE PURSUANT TO SECTION 12-43-304 (1)(d), 12-43-404 (2)(c), 12-43-504 (1)(d), 12-43-603 (1)(d), OR 12-43-804 (1)(g), AS APPLICABLE; AND

(d) IS OR WILL BE PROVIDING BEHAVIORAL HEALTH CARE SERVICES.

(6.5) "HEALTH PROFESSIONAL SHORTAGE AREA" MEANS A FEDERALLY DESIGNATED HEALTH PROFESSIONAL SHORTAGE AREA OR A STATE-DESIGNATED HEALTH PROFESSIONAL SHORTAGE AREA.

(12) "SCHOLARSHIP PROGRAM" MEANS THE SCHOLARSHIP PROGRAM FOR ADDICTION COUNSELORS CREATED IN SECTION 25-1.5-503.5.

(13) "STATE-DESIGNATED HEALTH PROFESSIONAL SHORTAGE AREA" MEANS AN AREA OF THE STATE DESIGNATED BY THE PRIMARY CARE OFFICE, IN ACCORDANCE WITH STATE-SPECIFIC METHODOLOGIES ESTABLISHED BY THE STATE BOARD BY RULE PURSUANT TO SECTION 25-1.5-404 (1)(a), AS EXPERIENCING A SHORTAGE OF HEALTH CARE PROFESSIONALS OR BEHAVIORAL HEALTH CARE PROVIDERS.

(14) "UNDERSERVED POPULATION" MEANS ANY OF THE FOLLOWING:

(a) INDIVIDUALS ELIGIBLE FOR MEDICAL ASSISTANCE UNDER ARTICLES 4 TO 6 OF TITLE 25.5;

(b) INDIVIDUALS WHO ARE PROVIDED SERVICES BY A BEHAVIORAL HEALTH CARE PROVIDER AND ARE EITHER CHARGED FEES ON A SLIDING SCALE BASED UPON INCOME OR ARE SERVED WITHOUT CHARGE.

SECTION 6. In Colorado Revised Statutes, 25-1.5-503, **amend** (1), (2), (5), and (6) as follows:

25-1.5-503. Colorado health service corps - program - creation - conditions - rules. (1) (a) (I) ~~Beginning July 1, 2009,~~ The primary care office shall maintain and administer, subject to available appropriations, the Colorado health service corps. Subject to available appropriations, the Colorado health service corps shall provide loan repayment for certain eligible:

(A) Health care professionals who provide primary health services; ~~Beginning July 1, 2011, the Colorado health service corps shall also provide loan repayment for certain eligible~~

(B) Nursing faculty or health care professional faculty members in

qualified faculty positions; AND

(C) BEHAVIORAL HEALTH CARE PROVIDERS AND CANDIDATES FOR LICENSURE WHO PROVIDE BEHAVIORAL HEALTH CARE SERVICES.

(II) Under the Colorado health service corps, subject to the limitations specified in subsection (2) of this section, upon entering into a loan contract the state may either:

(A) Make payments on the education loans of the health care professional, BEHAVIORAL HEALTH CARE PROVIDER, CANDIDATE FOR LICENSURE, nursing faculty member, or health care professional faculty member; or

(B) Agree to make an advance payment in a lump sum of all or part of the principal, interest, and related expenses of the education loans of health care professionals, BEHAVIORAL HEALTH CARE PROVIDERS, CANDIDATES FOR LICENSURE, nursing faculty members, or health care professional faculty members, subject to the limitations specified in subsection (2) of this section.

(III) (A) In consideration for receiving repayment of all or part of his or her education loan, the health care professional shall agree to provide primary health services in ~~federally designated~~ health professional shortage areas in Colorado.

(B) IN CONSIDERATION FOR RECEIVING REPAYMENT OF ALL OR PART OF HIS OR HER EDUCATION LOAN, THE BEHAVIORAL HEALTH CARE PROVIDER OR CANDIDATE FOR LICENSURE SHALL AGREE TO PROVIDE BEHAVIORAL HEALTH CARE SERVICES IN HEALTH PROFESSIONAL SHORTAGE AREAS IN COLORADO.

(IV) In consideration for receiving repayment of all or part of his or her education loan, the nursing or other health care professional faculty member must agree to serve two or more consecutive academic years in a qualified faculty position.

(b) Repayment of loans under the Colorado health service corps may be made using ~~moneys~~ MONEY in the Colorado health service corps fund. The primary care office is authorized to receive and expend gifts, grants,

and donations or ~~moneys~~ MONEY appropriated by the general assembly for the purpose of implementing the Colorado health service corps. In administering the Colorado health service corps, the primary care office shall collaborate with appropriate partners as needed to maximize the federal ~~moneys~~ MONEY available to the state for state loan repayment programs through the federal department of health and human services. The selection of health care professionals, BEHAVIORAL HEALTH CARE PROVIDERS, CANDIDATES FOR LICENSURE, nursing faculty members, and health care professional faculty members for participation in the Colorado health service corps is exempt from the competitive bidding requirements of the "Procurement Code", articles 101 to 112 of title 24. ~~C.R.S.~~

(c) THE FOLLOWING PROVIDERS ARE NOT ELIGIBLE FOR LOAN REPAYMENT THROUGH THE COLORADO HEALTH SERVICE CORPS:

~~(c)~~ (I) Health care professionals WHO ARE NOT practicing in ~~nonprimary~~ PRIMARY care specialties or providing ~~nonprimary~~ PRIMARY health services; ~~are not eligible for loan repayments through the Colorado health service corps~~ AND

(II) BEHAVIORAL HEALTH CARE PROVIDERS AND CANDIDATES FOR LICENSURE WHO ARE NOT PROVIDING BEHAVIORAL HEALTH CARE SERVICES.

(d) (I) As a condition of receiving a loan repayment through the Colorado health service corps, a health care professional OR BEHAVIORAL HEALTH CARE PROVIDER must enter into a contract pursuant to which the health care professional OR BEHAVIORAL HEALTH CARE PROVIDER agrees to practice for at least two years in a community that is located in a ~~federally designated~~ health professional shortage area. The health care professional OR BEHAVIORAL HEALTH CARE PROVIDER, AS APPLICABLE, the primary care office, and the community employer with which the health care professional OR BEHAVIORAL HEALTH CARE PROVIDER is practicing must be parties to the contract.

(II) As a condition of receiving a loan repayment through the Colorado health service corps, a nursing faculty or health care professional faculty member must enter into a contract pursuant to which he or she agrees to serve at least two consecutive academic years or their equivalent in a qualified faculty position. The nursing faculty or health care professional faculty member, the primary care office, and the educational

institution where the qualified faculty position is located must be parties to the contract.

(III) AS A CONDITION OF RECEIVING A LOAN REPAYMENT THROUGH THE COLORADO HEALTH SERVICE CORPS, A CANDIDATE FOR LICENSURE MUST ENTER INTO A CONTRACT PURSUANT TO WHICH THE CANDIDATE FOR LICENSURE AGREES TO PRACTICE FOR AT LEAST TWO YEARS AFTER OBTAINING THE LICENSE, PLUS AN ADDITIONAL AMOUNT OF TIME EQUIVALENT TO THE TIME SPENT OBTAINING THE SUPERVISED EXPERIENCE HOURS REQUIRED FOR LICENSURE WHILE PARTICIPATING IN THE PROGRAM, IN A COMMUNITY THAT IS LOCATED IN A HEALTH PROFESSIONAL SHORTAGE AREA. THE CANDIDATE FOR LICENSURE, THE PRIMARY CARE OFFICE, AND THE COMMUNITY EMPLOYER WITH WHICH THE CANDIDATE FOR LICENSURE IS PRACTICING MUST BE PARTIES TO THE CONTRACT.

(2) Subject to available appropriations, the primary care office shall annually select health care professionals, BEHAVIORAL HEALTH CARE PROVIDERS, CANDIDATES FOR LICENSURE, nursing faculty members, and health care professional members from the list provided by the advisory council pursuant to ~~section 25-1.5-504 (6)~~ SECTION 25-1.5-504 (5)(a) to participate in the Colorado health service corps.

(5) (a) A health care professional participating in the Colorado health service corps shall not practice with a for-profit private group or solo practice or at a proprietary hospital or clinic.

(b) FOR A BEHAVIORAL HEALTH CARE PROVIDER OR CANDIDATE FOR LICENSURE APPLYING TO PARTICIPATE IN THE COLORADO HEALTH SERVICE CORPS, THE ADVISORY COUNCIL SHALL PRIORITIZE BEHAVIORAL HEALTH CARE PROVIDERS AND CANDIDATES FOR LICENSURE WHO ARE PRACTICING WITH A NONPROFIT OR PUBLIC EMPLOYER. THE ADVISORY COUNCIL MAY ALSO CONSIDER FOR PARTICIPATION IN THE COLORADO HEALTH SERVICE CORPS BEHAVIORAL HEALTH CARE PROVIDERS AND CANDIDATES FOR LICENSURE WHO ARE PRACTICING WITH A FOR-PROFIT EMPLOYER, SUCH AS A PRIVATE PRACTICE OR OTHER SITE, THAT PROVIDES SERVICES TO AN UNDERSERVED POPULATION.

(6) A contract for loan repayment entered into pursuant to this part 5 must not include terms that are more favorable to health care professionals, BEHAVIORAL HEALTH CARE PROVIDERS, OR CANDIDATES FOR

LICENSURE than the most favorable terms that the secretary of the federal department of health and human services is authorized to grant under the national health services corps program. In addition, each contract must include penalties for breach of contract that are at least as stringent as those available to the secretary of the federal department of health and human services. In the event of a breach of contract for a loan repayment entered into pursuant to this part 5, the primary care office shall enforce the contract and collect any damages or other penalties owed.

SECTION 7. In Colorado Revised Statutes, add 25-1.5-503.5 as follows:

25-1.5-503.5. Scholarship program for addiction counselors - creation - eligibility - conditions - rules. (1) BEGINNING IN THE 2018-19 STATE FISCAL YEAR, THE PRIMARY CARE OFFICE SHALL MAINTAIN AND ADMINISTER A SCHOLARSHIP PROGRAM TO ASSIST IN INCREASING THE POPULATION OF CERTIFIED ADDICTION COUNSELORS PROVIDING BEHAVIORAL HEALTH CARE SERVICES IN HEALTH PROFESSIONAL SHORTAGE AREAS. SUBJECT TO AVAILABLE APPROPRIATIONS, THE PRIMARY CARE OFFICE SHALL AWARD SCHOLARSHIPS TO HELP DEFRAY THE EDUCATION AND TRAINING COSTS ASSOCIATED WITH OBTAINING CERTIFICATION AS AN ADDICTION COUNSELOR OR WITH PROGRESSING TO A HIGHER LEVEL OF CERTIFICATION FOR APPLICANTS WHO AGREE TO PRACTICE IN A HEALTH PROFESSIONAL SHORTAGE AREA FOR A SPECIFIED PERIOD.

(2) UNDER THE SCHOLARSHIP PROGRAM, SUBJECT TO THE LIMITATIONS SPECIFIED IN THIS SECTION, UPON ENTERING INTO A SCHOLARSHIP CONTRACT, THE STATE MAY PAY UP TO THE FULL COST OF EDUCATIONAL MATERIALS AND DIRECT EXPENSES ASSOCIATED WITH EDUCATION AND TRAINING REQUIRED FOR CERTIFICATION AS AN ADDICTION COUNSELOR OR FOR PROGRESSING TO A HIGHER LEVEL OF ADDICTION COUNSELOR CERTIFICATION, WHICH AMOUNT SHALL BE PAID TO THE ACADEMIC INSTITUTION OR STATE-APPROVED TRAINER WHERE THE ADDICTION COUNSELOR STUDENT IS ENROLLED OR PARTICIPATING.

(3) AS A CONDITION OF RECEIVING A SCHOLARSHIP AWARD TO ASSIST WITH OBTAINING CERTIFICATION OR A HIGHER LEVEL OF CERTIFICATION, AN APPLICANT MUST ENTER INTO A CONTRACT WITH THE PRIMARY CARE OFFICE PURSUANT TO WHICH HE OR SHE AGREES TO SERVE AT LEAST SIX CONSECUTIVE MONTHS IN A COMMUNITY THAT IS LOCATED IN A HEALTH

PROFESSIONAL SHORTAGE AREA.

(4) SUBJECT TO AVAILABLE APPROPRIATIONS, THE PRIMARY CARE OFFICE SHALL ANNUALLY SELECT APPLICANTS FROM THE LIST PROVIDED BY THE ADVISORY COUNCIL PURSUANT TO SECTION 25-1.5-504 (5)(b) FOR SCHOLARSHIP AWARDS UNDER THIS SECTION.

(5) FOR PURPOSES OF RECOMMENDING SCHOLARSHIP AWARDS, THE ADVISORY COUNCIL SHALL PRIORITIZE ADDICTION COUNSELORS WHO ARE PRACTICING WITH A NONPROFIT OR PUBLIC EMPLOYER. THE ADVISORY COUNCIL MAY ALSO CONSIDER FOR PARTICIPATION IN THE SCHOLARSHIP PROGRAM ADDICTION COUNSELORS WHO ARE PRACTICING WITH A FOR-PROFIT EMPLOYER, SUCH AS A PRIVATE PRACTICE OR OTHER SITE, THAT PROVIDES SERVICES TO AN UNDERSERVED POPULATION.

(6) IN THE EVENT OF A BREACH OF CONTRACT FOR A SCHOLARSHIP ENTERED INTO UNDER THIS SECTION, THE PRIMARY CARE OFFICE SHALL ENFORCE THE CONTRACT AND COLLECT ANY DAMAGES OR OTHER PENALTIES OWED.

SECTION 8. In Colorado Revised Statutes, 25-1.5-504, **amend** (1), (2) introductory portion, (2)(l), and (5); and **add** (2)(n) and (2)(o) as follows:

25-1.5-504. Colorado health service corps advisory council - creation - membership - duties. (1) There is hereby created in the primary care office the Colorado health service corps advisory council to review applications for participation in the Colorado health service corps AND FOR SCHOLARSHIPS UNDER SECTION 25-1.5-503.5 and TO make recommendations to the primary care office pursuant to section 25-1.5-503 (2) AND 25-1.5-503.5 (4).

(2) The advisory council consists of ~~thirteen~~ FIFTEEN members appointed by the governor as provided in this subsection (2). In appointing members of the advisory council, the governor shall ensure that the advisory council includes at least one representative from each of the following organizations:

(l) A physician who is a faculty member of a medical school in Colorado; and

(n) A MEMBERSHIP ORGANIZATION REPRESENTING SUBSTANCE USE DISORDER SERVICE PROVIDERS; AND

(o) A LICENSED OR CERTIFIED ADDICTION COUNSELOR WHO HAS EXPERIENCE IN RURAL HEALTH, SAFETY NET CLINICS, OR HEALTH EQUITY.

(5)(a) The advisory council shall review applications received from health care professionals, BEHAVIORAL HEALTH CARE PROVIDERS, CANDIDATES FOR LICENSURE, nursing faculty members, and health care professional faculty members to participate in the Colorado health service corps. Subject to available appropriations and federal requirements concerning eligibility for federal loan repayment matching funds, the advisory council shall annually select health care professionals, BEHAVIORAL HEALTH CARE PROVIDERS, CANDIDATES FOR LICENSURE, nursing faculty members, and health care professional faculty members to participate in the Colorado health service corps and shall forward its list of selected participants to the primary care office.

(b) THE ADVISORY COUNCIL SHALL REVIEW APPLICATIONS RECEIVED FOR PARTICIPATION IN THE SCHOLARSHIP PROGRAM. SUBJECT TO AVAILABLE APPROPRIATIONS, THE ADVISORY COUNCIL SHALL ANNUALLY SELECT ADDICTION COUNSELORS TO PARTICIPATE IN THE SCHOLARSHIP PROGRAM AND SHALL FORWARD ITS LIST OF SELECTED PARTICIPANTS TO THE PRIMARY CARE OFFICE.

SECTION 9. In Colorado Revised Statutes, **amend 25-1.5-505** as follows:

25-1.5-505. Advisory council - report. (1) On or before December 1, 2011, and on or before December 1 every two years thereafter, THE PRIMARY CARE OFFICE, WITH ASSISTANCE FROM the advisory council, shall submit to the governor, the health and human services committee of the senate, ~~and~~ the COMMITTEES ON health, INSURANCE, and environment ~~committee~~ AND ON PUBLIC HEALTH CARE AND HUMAN SERVICES of the house of representatives, or any successor committees, a report that includes, at a minimum, the following information:

(a) ~~Identification and a summary of successful loan forgiveness programs for health care professionals and best practices in health care professional loan forgiveness programs across the country~~ A DESCRIPTION

OF THE HEALTH CARE PROFESSIONALS, BEHAVIORAL HEALTH CARE PROVIDERS, CANDIDATES FOR LICENSURE, NURSING FACULTY MEMBERS, AND HEALTH CARE PROFESSIONAL FACULTY MEMBERS PARTICIPATING IN THE COLORADO HEALTH SERVICE CORPS PROGRAM AND THE SCHOLARSHIP PROGRAM;

(b) A description of the programmatic goals of the Colorado health service corps AND THE SCHOLARSHIP PROGRAM, including the present status of and any barriers to meeting those goals;

(c) Existing efforts and potential future projects to overcome any barriers to meeting the programmatic goals of the Colorado health service corps AND THE SCHOLARSHIP PROGRAM;

(d) An analysis of the ~~impact~~ EFFECTS of the Colorado health service corps program AND THE SCHOLARSHIP PROGRAM ON ADDRESSING THE HEALTH CARE AND BEHAVIORAL HEALTH CARE NEEDS OF COMMUNITIES IN COLORADO;

~~(e) If applicable, results of any surveys conducted of state health professional incentive programs in primary care and any recommendations to individually enhance, improve coordination among, and potentially consolidate existing or potential programs to better address Colorado's primary care workforce issues~~ A SUMMARY OF ANY ASSESSMENT OR EVALUATION OF PROGRAM PERFORMANCE CONDUCTED DURING THE YEAR; and

~~(f) The number of~~ A DESCRIPTION OF THE nursing faculty or other health care professional faculty members ~~who receive moneys from~~ PARTICIPATING IN the Colorado health service corps and the ~~number of~~ educational institutions where the ~~recipients~~ PARTICIPANTS teach.

(2) THE DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT SHALL INCLUDE THE REPORT REQUIRED BY THIS SECTION AS PART OF ITS "STATE MEASUREMENT FOR ACCOUNTABLE, RESPONSIVE, AND TRANSPARENT (SMART) GOVERNMENT ACT" HEARING REQUIRED BY SECTION 2-7-203.

(3) THE REPORTING REQUIREMENT IN THIS SECTION IS NOT SUBJECT TO SECTION 24-1-136 (11)(a)(I).

SECTION 10. In Colorado Revised Statutes, amend 25-1.5-506 as follows:

25-1.5-506. Colorado health service corps fund - created - acceptance of grants and donations - annual appropriation from marijuana tax cash fund. (1) The Colorado health service corps fund is hereby created in the state treasury, which fund consists of:

(a) All general fund moneys MONEY appropriated by the general assembly for the Colorado health service corps, the first five hundred thousand dollars of which shall be used solely for loan repayments for nursing faculty;

(b) Damages and penalties collected from breach of contract actions for loan repayment contracts; and

(c) For the 2016-17 fiscal year and each fiscal year thereafter, tobacco litigation settlement moneys MONEY transferred to the fund by the state treasurer pursuant to section 24-75-1104.5 (1.7)(n). ~~C.R.S.~~

(2) (a) The moneys MONEY in the fund, other than the moneys MONEY described in ~~paragraph (c) of subsection (1)~~ SUBSECTION (1)(c) of this section, ~~are~~ IS hereby continuously appropriated to the primary care office for the Colorado health service corps. Any moneys MONEY in the fund not expended for the purpose of this part 5 may be invested by the state treasurer as provided by law. All interest and income derived from the investment and deposit of moneys MONEY in the fund shall be credited to the fund. Any unexpended and unencumbered moneys MONEY remaining in the fund at the end of a fiscal year ~~remain~~ REMAINS in the fund and shall not be credited or transferred to the general fund or another fund.

(b) The moneys MONEY described in ~~paragraph (c) of subsection (1)~~ SUBSECTION (1)(c) of this section ~~are~~ IS subject to annual appropriation by the general assembly to the primary care office for the Colorado health service corps.

(3) The primary care office is authorized to receive contributions, grants, and services from public and private sources, AND TO EXPEND PUBLIC OR PRIVATE CONTRIBUTIONS AND GRANTS, to carry out the purposes of this part 5.

(4) (a) FOR THE 2018-19 FISCAL YEAR AND EACH FISCAL YEAR THEREAFTER, THE GENERAL ASSEMBLY SHALL APPROPRIATE TWO MILLION FIVE HUNDRED THOUSAND DOLLARS FROM THE MARIJUANA TAX CASH FUND CREATED IN SECTION 39-28.8-501 TO THE PRIMARY CARE OFFICE TO:

(I) PROVIDE LOAN REPAYMENT FOR BEHAVIORAL HEALTH CARE PROVIDERS AND CANDIDATES FOR LICENSURE PARTICIPATING IN THE COLORADO HEALTH SERVICE CORPS; AND

(II) AWARD SCHOLARSHIPS TO ADDICTION COUNSELORS PARTICIPATING IN THE SCHOLARSHIP PROGRAM.

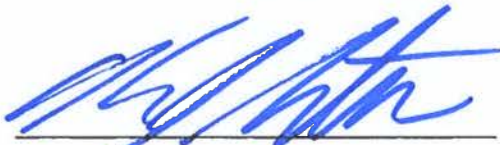
(b) SINCE BEHAVIORAL HEALTH CARE PROVIDERS, CANDIDATES FOR LICENSURE, AND ADDICTION COUNSELORS PROVIDE BEHAVIORAL HEALTH CARE SERVICES AND TREATMENT TO PEOPLE WITH SUBSTANCE USE OR MENTAL HEALTH DISORDERS, USE OF MONEY IN THE MARIJUANA TAX CASH FUND IS PERMITTED UNDER SECTION 39-28.8-501 (2)(b)(IV)(C).

SECTION 11. Appropriation. For the 2018-19 state fiscal year, \$2,500,000 is appropriated to the department of public health and environment for use by the prevention services division. This appropriation is from the marijuana tax cash fund created in section 39-28.8-501 (1), C.R.S., and is based on an assumption that the division will require an additional 2.0 FTE. To implement this act, the division may use this appropriation for the Colorado health service corps in the primary care office.

SECTION 12. Effective date. This act takes effect July 1, 2018.

SECTION 13. Safety clause. The general assembly hereby finds,

determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.



Kevin J. Grantham
PRESIDENT OF
THE SENATE



Crisanta Duran
SPEAKER OF THE HOUSE
OF REPRESENTATIVES

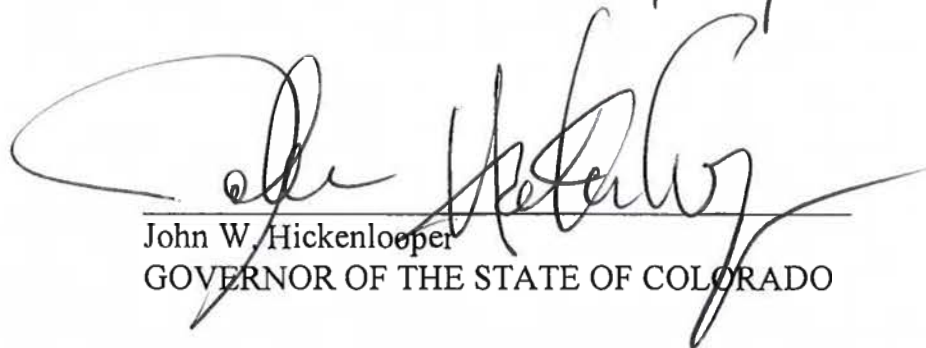


Effie Ameen
SECRETARY OF
THE SENATE



Marilyn Eddins
CHIEF CLERK OF THE HOUSE
OF REPRESENTATIVES

APPROVED 2:19 PM 5/21/18



John W. Hickenlooper
GOVERNOR OF THE STATE OF COLORADO

1 DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
2 Prevention Services Division
3 STATE-DESIGNATED HEALTH PROFESSIONAL SHORTAGE AREA DESIGNATION
4 6 CCR 1015-6

5 Rulemaking adopted _____; effective_____.

6
7 **1.1 Purpose**

8 This rule establishes quantitative methods for determining which areas of Colorado have a
9 shortage of health care providers and thus, should receive a state designation as a health
10 professional shortage area. The methodology for substance use disorder designation is based
11 upon:

- 12 1) The estimated demand for substance use disorder service encounters within a
13 population defined by a discrete geographic area;
- 14
15 2) The estimated supply of substance use disorder service encounters for the
16 population within a discrete geographic area;
- 17
18 3) The determination of whether supply meets demand within a discrete
19 geographic area; and
- 20
21 4) The designation of geographic areas as substance use disorder health
22 professional shortage areas where the resultant supply falls short of estimated
23 demand for minimally adequate substance use disorder treatment.
- 24

25 **1.2 Authority**

26 This regulation is adopted pursuant to the authority in Section 25-1.5-404(1)(a), Colorado
27 Revised Statutes.

28
29 **1.3 Definitions**

- 30
31 1) "Behavioral Health Care Provider," pursuant to Section 25-1.5-502(1.3), C.R.S.,
32 means the following providers who provide behavioral health care services
33 within their scope of practice:
 - 34 a) a licensed addiction counselor (LAC),
 - 35 b) a certified addiction counselor (CAC),
 - 36 c) a licensed professional counselor (LPC),
 - 37 d) a licensed clinical social worker (LCSW),
 - 38 e) a licensed marriage and family therapist (LMFT),
 - 39 f) a licensed psychologist (Ph.D. or Psy.D.),
 - 40 g) a licensed physician assistant (PA) with specific training in substance
41 use disorder,
 - 42 h) an advanced practice nurse (APN) with specific training in substance use
43 disorder, pain management, or psychiatric nursing, or
 - 44

- 45 i) a physician with specific board certification or training in addiction
46 medicine, pain management, or psychiatry.
47
- 48 2) "Behavioral Health Care Services," pursuant to Section 25-1.5-502(1.5), C.R.S.,
49 means services for the prevention, diagnosis, and treatment of, and the
50 recovery from, mental health and substance use disorders.
51
- 52 3) "Capacity" means the typical volume of health service encounters a health
53 care professional can produce within the scope of his or her practice and
54 scheduled clinical hours.
55
- 56 4) "Catchment Area" means a discrete geographic area where a preponderance of
57 the civilian noninstitutionalized population within the service area could
58 reasonably expect to access behavioral health services within the service area
59 without excessive travel, when it is adequately resourced.
60
- 61 5) "Census Block Group" means a statistical division of a census tract defined by
62 the United States Census Bureau.
63
- 64 6) "Civilian Noninstitutionalized Population" are all people who live and sleep
65 most of the time within the boundaries of a geographic area but are not housed
66 in a group quarter such as a correctional institution, juvenile facility, military
67 installation, or dormitory.
68
- 69 7) "Colorado Health Systems Directory" means the clinician data system
70 administered the Colorado Department of Public Health and Environment's
71 Primary Care Office (section 25-1.5-403, C.R.S.) which provides a
72 comprehensive database of all licensed clinicians and health care sites in
73 Colorado.
74
- 75 8) "Encounter" means an instance of direct provider to patient interaction with
76 the primary purpose of diagnosing, evaluating or treating a patient's substance
77 use disorder.
78
- 79 9) "Minimally Adequate Treatment" means the minimum necessary health care
80 service visits for diagnosis, treatment or recovery needed to address a specific
81 or general medical or behavioral health care service need.
82
- 83 10) "Prevalence" means the proportion of a population who has substance use
84 disorder at some point within the previous year.
85
- 86 11) "Polygon" means a closed, irregular geometric shape on a map surface that
87 defines equivalent road travel distances from a central point within the shape.
88

- 89 12) "Population Centroid" means the geometric center of a group of population
90 points within a geographic shape (e.g., census block group).
91
- 92 13) "State-Designated Health Professional Shortage Area," pursuant to Section 25-
93 1.5-402(11) and Section 25-1.5-502(13), C.R.S., means an area of the state
94 designated by the Primary Care Office in accordance with state-specific
95 methodologies established by the State Board by rule pursuant to Section 25-
96 1.5-404 (1)(a), C.R.S., as experiencing a shortage of health care professionals
97 or behavioral health care providers.
98
- 99 14) "State Designated Substance Use Disorder Health Professional Shortage Area"
100 means a State-Designated Health Professional Shortage Area experiencing a
101 shortage of behavioral health care providers providing behavioral health care
102 services for substance use disorder.
103
- 104 15) "Substance Use Disorder" means mild, moderate, or severe recurrent use of
105 drugs and/or alcohol that causes clinically and functionally significant
106 impairment of individuals. Impairment may include health concerns, disability,
107 risky behavior, social impairment, and failure to perform significant
108 responsibilities at work, school, or with family. The diagnosis may be applied to
109 the abuse of one or more of ten separate classes of drugs including alcohol,
110 caffeine, cannabis, hallucinogens, inhalants, opioids, sedatives, stimulants,
111 tobacco, and other substances. The dependent use of tobacco and caffeine are
112 not a primary focus of this rule.
113

114 1.4 Substance Use Disorder Health Professional Shortage Area Determination Method

115

- 116 1) Catchment areas are created for analysis of behavioral health care provider
117 capacity by determining **equivalent**-standard road travel distances from the
118 population centroid of each census block group in Colorado.
119
- 120 2) The population of each catchment area is the civilian noninstitutionalized
121 population according to the most recent available data from United State Census
122 Bureau at the time of analysis.
123
- 124 3) The estimated burden of substance use disorder within each catchment area is
125 determined by multiplying the civilian noninstitutionalized population in the
126 catchment area (section 1.4(2)) by substance use disorder prevalence according to
127 age and sex. Substance use disorder prevalence is determined using the most
128 recent available data from the National Survey on Drug Use and Health
129 administered by the U.S. Department of Health and Human Services, Substance Use
130 and Mental Health Services Administration.
131
- 132 4) The estimated behavioral health services demand for substance use disorder in

133 each catchment area is determined by multiplying the estimated burden of
134 substance use disorder (section 1.4(3)) by the number of minimally adequate
135 treatments as reported in the National Comorbidity Survey - Replication
136 administered by the U.S. Department of Health and Human Services, Substance Use
137 and Mental Health Services Administration.

138
139 5) The estimated substance use disorder services supply in each catchment area is
140 determined by evaluating a list of behavioral health care providers with a practice
141 address within the catchment area and the behavioral health care providers'
142 encounter productivity. The list of behavioral health care providers is derived from
143 the most recent available data reported in the Colorado Health Systems Directory
144 administered by the Colorado Department of Public Health and Environment's
145 Primary Care Office. Each behavioral health care provider is assigned a behavioral
146 health service 12 month productivity rate. The sum of encounter productivity for
147 all practicing behavioral health care providers in the catchment area is the total
148 estimated substance use disorder services supply in the catchment area.

149
150 6) Designation of a census block group as a State Designated Substance Use Disorder
151 Health Professional Shortage Area occurs when the supply of behavioral health
152 service encounters falls below the per capita demand for minimally adequate
153 treatment for those who experience substance use disorder within the catchment
154 area.

155
156 7) Current designation status of each region of the state will be posted at least
157 annually on or about July 1 on a publicly accessible website.

158

159 1.5 Data Sources

160

161 1) If current data from the sources cited above are unavailable, the department
162 may rely upon a comparable data sources.

163

164 2) To the extent available, reliable and practicable, the department will rely
165 upon data collected within one year prior to analysis.

166

167 3) Behavioral health care providers practice characteristics data may be derived
168 from direct survey methods, claims analysis, peer reviewed and validated
169 workforce research tools, and statistical methods.

170

171 1.6 Review

172 Shortage designation status will be reviewed in 2018 and at least every three years
173 thereafter. More frequent review may be performed where data is available and analytical
174 resources are available. Designation status of each area will remain effective for 36 months
175 from the date of publication or when replaced by a more recent analysis.