Inclusion

Emergency COVID-19 Pandemic Changes to Home- and Community-Based Services for People with Intellectual and Developmental Disabilities

--Manuscript Draft--

Manuscript Number:	INCLUSION-S-22-00024R2
Article Type:	Research Article
Keywords:	People with intellectual and developmental disabilities; COVID-19; Home- and Community-Based Services (HCBS) 1915(c) waivers; Appendix K; Medicaid Long-Term Services and Supports (LTSS)
Corresponding Author:	Carli Friedman, PhD CQL | The Council on Quality and Leadership Towson, Maryland UNITED STATES
First Author:	Carli Friedman, PhD
Order of Authors:	Carli Friedman, PhD
Manuscript Region of Origin:	UNITED STATES
Abstract:	The COVID-19 pandemic significantly disrupted Home- and Community-Based Services (HCBS) for people with intellectual and developmental disabilities (IDD). The aim of this study was to examine the emergency amendments states made to their HCBS waivers for people with IDD during the COVID-19 pandemic. To do so, we analyzed 294 Appendix K: Emergency Preparedness and Response Waivers, which states used to amend HCBS 1915(c) waivers for people with IDD. States' waiver amendments fell into the following categories: access and eligibility; assessments and person-centered planning; services; settings; providers; reimbursement rates; and safeguards and oversight. These temporary changes made to HCBS IDD waivers aimed to ensure people with IDD's access to services and maintain the quality of those services during the pandemic.

Abstract

The COVID-19 pandemic significantly disrupted Home- and Community-Based Services (HCBS) for people with intellectual and developmental disabilities (IDD). The aim of this study was to examine the emergency amendments states made to their HCBS waivers for people with IDD during the COVID-19 pandemic. To do so, we analyzed 294 *Appendix K: Emergency Preparedness and Response Waivers*, which states used to amend HCBS 1915(c) waivers for people with IDD. States' waiver amendments fell into the following categories: access and eligibility; assessments and person-centered planning; services; settings; providers; reimbursement rates; and safeguards and oversight. These temporary changes made to HCBS IDD waivers aimed to ensure people with IDD's access to services and maintain the quality of those services during the pandemic.

Keywords: People with intellectual and developmental disabilities; COVID-19; Home- and Community-Based Services (HCBS) 1915(c) waivers; Appendix K; Medicaid Long-Term Services and Supports (LTSS)

Home- and Community-Based Services (HCBS) 1915(c) waivers are a form of Long-Term Services and Supports (LTSS) which provide customized, wrap-around, community-based supports to people that would otherwise require institutional care to care for themselves because of disability, age, or functional limitations, such as people with intellectual and developmental disabilities (IDD). For example, HCBS for people with IDD often include residential supports, health and professional services, day and employment supports, respite and crisis services, transportation, and assistive technology. As a result of the preferences of people with IDD, the increased outcomes associated with community living, and the cost-effectiveness of community living over institutions, Medicaid HCBS waivers have become the largest funding stream for people with IDD. In fact, as of 2018, 79% of all LTSS for people with IDD was allocated to HCBS (Centers for Medicare and Medicaid Services, 2020).

The SARS-CoV-2 (COVID-19) pandemic, which began in March 2020, significantly disrupted HCBS (Gathright, 2020), the very safety net upon which many people with IDD depend upon to help support their health, safety, and quality of life (Burns, 2009). As research and knowledge about COVID-19 grew, it became increasingly apparent that people with IDD were at significantly greater risk for contracting and dying of COVID-19 than nondisabled people and other disability populations (Clift et al., 2021; Gleason et al., 2021; Hüls et al., 2021; Landes, Turk, Formica, et al., 2020; Landes, Turk, & Wong, 2020; Schott et al., 2021; Turk et al., 2020). This was due not only to their disabilities and medical conditions, but also because many people with IDD live in congregate settings and need personal care which requires close contact, both of which also increase their risks (Abrams et al., 2020; Brown et al., 2021; Chakraborty, 2021; Clift et al., 2021; Landes, Turk, Formica, et al., 2020; Landes, Turk, & Wong, 2020; Turk et al., 2020).

As a result of the increased risk to people with IDD, as well as government safety orders, most HCBS providers serving people with IDD had to close service lines, resulting in people with IDD not being able to receive certain services (e.g., day services) and in increased provider instability due to lost revenue (ANCOR Foundation & United Cerebral Palsy, 2021; Avalere Health, 2020; Bradley, 2020; Ervin & Hobson-Garcia, 2020). Direct support professional (DSP) turnover, which was already at 'crisis' levels prior to the pandemic, also increased significantly as a result of the added risks to DSPs, increased workloads, and/or DSPs needing to take care of their family members (ANCOR Foundation & United Cerebral Palsy, 2021; Gathright, 2020; Luterman, 2020). As a result of these issues, not only did the quality of people with IDD's services decrease, many providers also struggled to function and stay in business because of a lack of resources and funds (ANCOR Foundation & United Cerebral Palsy, 2021; Bradley, 2020; Embregts et al., 2022; Lund et al., 2020; Nygren & Lulinski, 2020; Scheffers et al., 2021).

To meet the challenges of this ever-growing crisis in HCBS, states began implementing emergency changes to their HCBS programs to promote the health, safety, and quality of life of waiver participants during the pandemic. During times of emergency, such as pandemics, states can utilize *Appendix K: Emergency Preparedness and Response Waivers* to temporarily amend their HCBS 1915(c) waiver programs (Centers for Medicare and Medicaid Services, n.d.-a). The aim of this study was to examine the emergency amendments states made to their HCBS waivers for people with IDD during the COVID-19 pandemic. Our research question was: how did states amend their HCBS waivers for people with IDD using emergency authorizations during the COVID-19 pandemic? To explore this research question, we analyzed Appendix K waivers which amended HCBS 1915(c) waivers for people with IDD.

Methods

This study is an analysis of states' Appendix K: Emergency Preparedness and Response amendments to their HCBS waivers. We obtained CMS approved Appendix K waivers from the Medicaid.gov website's *Approved HCBS 1915(c) Appendix K Datatable* on April 7, 2022 (Centers for Medicare and Medicaid Services, n.d.-b). Our inclusion criteria required Appendix Ks be amending HCBS waivers specifically for people with IDD (i.e., intellectual disability, developmental disability, and/or autism spectrum). Moreover, only Appendix Ks for the COVID-19 pandemic were included – those for natural disasters, such as hurricanes, were excluded from data collection. This process resulted in a collection of 294 Appendix K applications.

In Appendix Ks, CMS requires states to document the ways it will temporarily change or amend each waiver for the emergency, in this case, the COVID-19 pandemic (Centers for Medicare and Medicaid Services, n.d.-a). States are required to check (yes/no) the applicable fields relevant to the changes they wish to make regarding access, eligibility, services, requirements, etc.~~, and, in some cases, also provide corresponding comments to describe the breadth of those changes~~. We analyzed the checkboxes by applying quantitative binary indicator coding – 1 was applied for yes, 0 for no ~~(yes [1], no [0])~~ — and then aggregating across Appendix Ks for each section; descriptive statistics – percent yes out of total – were then used to analyze trends across states (Hardy, 1993; Warner, 2013).

~~For any available/applicable comment fields in the Appendix Ks, we used content analysis, a common form of analysis for text-based data . describes, content analysis is a "qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings" . Using content analysis, we assigned a code to each comment; while doing so we created an emerging inductive coding scheme using~~

~~the constant comparison methods . When all of the comments were coded, we returned to the data to confirm alignment with the coding scheme and consistency of the coding.~~

Results

Between March 18, 2020, and April 7, 2022, 44 states and the District of Columbia temporarily amended their HCBS 1915(c) waivers for people with IDD to provide emergency supports and services (Table 1; three states did not offer HCBS IDD waivers, one state combined HCBS populations, and two states did not amend their HCBS IDD waivers using Appendix K). The waiver amendments made by states fell into the following categories: access and eligibility; assessments and person-centered planning; services; settings; providers; reimbursement rates; and safeguards and oversight.

Access and Eligibility

States utilized Appendix Ks to change IDD waiver access and eligibility to promote access to HCBS during the COVID-19 pandemic (Tables 2 and 3). Cost limits are the ratio between expected HCBS costs and institutional costs for the person being served; to control overspending states often cap costs (Centers for Medicare and Medicaid Services, 2019). During the COVID-19 pandemic, approximately one-quarter of states (26.7%, n = 12) temporarily increased cost limits for entry into the waiver in order to help expand people with IDD's access to services.

A number of states (13.3%, n = 6) also modified additional targeting criteria, which defines the population served by the waiver. ~~In particular, Alabama, Kansas, and North Carolina allowed people with IDD to remain enrolled in the waiver without discharge, often if they received at least one service and if they were monitored. Massachusetts and Maryland temporarily raised/waived age requirements for their waivers for autistic children. In addition,~~

Formatted: Indent: First line: 0.5"

~~two states (4.4%; Arkansas and Maryland) increased the unduplicated number of participants for their IDD waivers, in order to serve more people with IDD during the pandemic.~~

Assessments and Person-Centered Planning

States commonly amended their care assessments and person-centered planning processes during the COVID-19 pandemic. Most states (82.2%, *n* = 37) temporarily modified the processes for level of care re/evaluations, which determine the need for services, within regulatory requirements. While doing so, most states (71.1%, *n* = 32) allowed evaluations, assessments, and person-centered planning meetings to be conducted virtually/remotely in lieu of face-to-face meetings. Moreover, 68.9% of states (*n* = 31) allowed required documents for evaluations and person-centered plans to be signed electronically. In addition, 62.2% of states (*n* = 28) allowed an extension for reassessment and re-evaluations for up to one year past the due date.~~; this aimed to help reduce infection risks, as well as the burden on people with IDD and staff.~~

~~——~~More than three-quarters of states (80.0%, *n* = 36) temporarily modified their person-centered service plan development process~~, including by allowing the plan renewal to be extended, allowing for virtual/remote planning meetings, allowing for electronic signatures on plans, and modifying the staff qualifications required for plan development. A few states also noted within this section of their Appendix K waiver that people with IDD's rights to choose where and with whom they lived (per the HCBS Settings Rule) could be suspended during the pandemic and did not need to be justified in the person-centered plan~~.

Formatted: Indent: First line: 0.5"

Services

States also utilized emergency authorizations to change the service in their HCBS waivers for people with IDD. Half of the states (51.1%, *n* = 23) temporarily added services to the

waiver to help address the emergency situation. ~~Added services included specialized medical equipment and assistive technology, home-delivered meals, personal care and residential supports, respite, nursing, support broker, and clinical and therapeutic services.~~ Many states (64.4%, *n* = 29) also temporarily modified the scope of their existing services~~, including personal care and residential supports, day programs, home-delivered meals, community integration supports, remote supports, and respite~~.

~~———~~Most states (82.2%, *n* = 37) elected to temporarily exceed service limitations, including amount, duration, and prior authorization, to help support people with IDD. ~~The services which states amended to exceed limitations commonly included: respite, personal care and residential supports, support coordination, home-delivered meals, transportation services, clinical and therapeutic services, assistive technology and specialized medical equipment, day services, nursing, and family support services.~~

Formatted: Indent: First line: 0.5"

To help expand people with IDD's access to services and supports, 55.6% of states (*n* = 25) also adjusted prior approval/authorization elements approved in their waivers. Typically, "When an item or service is subject to prior authorization, payment is not made unless approval for the item or service is obtained in advance either from state agency personnel or from a state fiscal agent or other contractor" (Centers for Medicare and Medicaid Services, 2019, p. 324). Amending the prior approval/authorization elements during the pandemic makes it easier for people with IDD to access services, such as hospital care, and items, such as medication and specialized medical equipment.

Settings

During the pandemic, most states temporarily changed where HCBS could be provided to people with IDD. More than three-quarters of states (95.5%, *n* = 42) added an electronic/remote

method of service delivery so that people with IDD could remotely receive services in their homes.

Moreover, 93.3% of states (*n* = 42) expanded the in-person settings where services could be provided to people with IDD~~; most commonly this included in the person's home, a caregiver's home, a provider-owned home (where the person with IDD did not live), a community center or shelter, a hotel or rented room, an ICF, or a remote/telehealth location. Examples of services that could be provided in alternative settings included: day services, residential supports, respite, clinical and therapeutic services, supported employment, peer mentorship, assistive technology and specialized medical equipment, community integration, and prevocational services.~~.

Formatted: Indent: First line: 0.5"

In addition, 68.9% of states (*n* = 31) allowed for people with IDD who are in an acute care hospital, nursing facility, or short-term institution stay because of COVID-19 or other reasons to receive the necessary supports which are not available or covered in that setting. ~~, such as communication supports, personal care, and supervision. Many states specified that services in these settings could not exceed 30 consecutive days.~~

Approximately one-third of states (31.1%, *n* = 14) allowed HCBS to be temporarily provided to people with IDD in out-of-state settings, if doing so was not already permitted in the waiver. ~~This was done both to help ensure the health and safety of people with IDD, especially if they temporarily relocated because of COVID-19, as well as to ensure people with IDD's needs were met. While permitting the use of out-of-state settings and services, many states still required state provider qualifications be met for providers and those providers be approved.~~

Providers

Almost all states (95.6%, *n* = 43) temporarily modified provider requirements. While doing so, the majority of states (93.3%, *n* = 42) temporarily modified provider qualifications. ~~This included suspending or delaying staff training requirements for certain types of training or certain service lines; some states also allowed staff training to be provided online/remotely. Many states also allowed background checks and fingerprinting to be delayed for new hires or suspended for family members who are paid to provide services. States also allowed altered staffing ratios to compensate for staff shortages.~~ In addition, 33.3% of states (*n* = 15) modified provider types. ~~Most frequently states did so in order to allow specialized medical equipment and assistive technology to be purchased from a wider variety of vendors. States also used this amendment to expand which types of staff or professionals could provide services and/or expedite certification for providers so they were eligible to provide additional service lines.~~ Moreover, 64.4% of states (*n* = 29) temporarily modified licensure or other requirements for settings where waiver services are furnished. ~~Often, this included postponing or extending agency certification and licensure reviews, changing allowed staffing ratios because of staff shortages, and allowing reviews to be conducted remotely.~~

Almost two-thirds of states (62.2%, *n* = 28) also amended their waivers so that, if not already permitted in the waiver, family members and other legally responsible individuals (i.e., legal guardians) could be paid to provide services to people with IDD. Approximately one-third of states (28.9%, *n* = 13) authorized case management entities to provide direct services. Only six states (13.3%) amended their HCBS waivers to temporarily establish or expanded self-direction opportunities for people with IDD.

Reimbursement and Payment

The overwhelming majority of states (88.9%, *n* = 40) temporarily increased reimbursement rates for services. ~~Reimbursement rates were expanded in order to maximize provider capacity for continuity of services and assure the health, safety, and welfare of people with IDD. Increased rates were aimed at offsetting the extra expenses involved with the pandemic because of administrative changes, personal protective equipment (PPE), reduced revenue due to changing service lines, and, especially, emergency staffing needs. States hoped the increased rates would help reduce DSP turnover by compensating for shortages, overtime, supporting quarantined people, and the extra costs of smaller staffing ratios due to social distancing.~~

It was also common for states (77.8%, *n* = 35) to temporarily include retainer payments to help providers continue operations, maintain their workforce, and survive to be able to provide services after the pandemic is over. ~~States provided retainer payments for an individual person's services when they were not able to participate; for example, if the person was in medical quarantine. States also provided retainer payments to providers when service lines were closed or could not be provided during the pandemic, including through remote or other means. In many cases, to receive retainer payments, states required providers to agree not to lay off staff or reduce staff wages.~~

Formatted: Indent: First line: 0.5"

Safeguards and Oversight

In terms of safeguards and oversight, to minimize infection and spread, 68.9% of states (*n* = 31) temporarily waived the HCBS Settings Rule requirements (42 CFR 441.301(c)(4)(vi)(D)) that people with IDD be able to have visitors of their choosing at any time. Approximately two-thirds of states (68.9%, *n* = 31) also temporarily modified incident reporting requirements, medication management procedures, and other participant safeguards. ~~This frequently included~~

~~requiring providers to report COVID-19 testing as part of incident reporting. States changed incident management processes, such as by extending the time to report or review evidence, not having to investigate service interruptions due to insufficient staffing, and allowing remote technology to be used for investigations.~~ Finally, 95.6% of states (*n* = 43) made 'other' necessary changes to address the needs of waiver participants with IDD~~; most commonly these included states extending the timeframe for their CMS waiver annual report submission (CMS 372)~~.

Discussion

People with IDD faced a lack of continuity and security during the COVID-19 pandemic, with HCBS service provision being significantly disrupted (citation removed for review). For these reasons, the aim of this study was to examine the emergency amendments states made to their HCBS waivers for people with IDD during the pandemic. Our findings revealed most states made changes to their HCBS waiver programs, expanding service delivery to ensure people with IDD could access the services and supports they needed during the pandemic. This ranged from expanding existing services to exceeding service limitations to adjusting prior approval/authorization elements. States also increased the variety of service settings, expanding the in-person settings where services could be provided and implementing telehealth, which had not commonly been used with people with IDD before in HCBS (citations removed for review). While telehealth use rapidly grew during the pandemic to compensate for in-person restrictions and has the potential to expand people's access to care and reduce health care disparities (Centers for Disease Control and Prevention, 2020; Dinesen et al., 2016; Scheffers et al., 2021), it is important to note that telehealth can be inaccessible for many people with IDD and people with IDD are less likely to have access to technology than nondisabled people (Anderson & Perrin, 2017; Annaswamy et al., 2020; Dobransky & Hargittai, 2016; Krysta et al., 2021; Lazar

& Jaeger, 2011; Young & Edwards, 2020). For these reasons, while the significant growth of telehealth represents a novel form of service delivery for HCBS for people with IDD, it is critical for attention be paid to accessibility of telehealth to ensure it maximizes the access of people with IDD, as well as the technology disparities people with IDD face.

In addition, states commonly made changes to minimize provider and DSP instability. Not only did most states modify provider requirements to reduce administrative burdens and barriers, but they also expanded who could provide services, including case managers and family caregivers. Allowing family caregivers to be paid for provider services helps compensate for staff shortages, as well as produces better health outcomes (Matthias & Benjamin, 2008); doing so may be especially beneficial during a pandemic to minimize the number of supporters people with IDD needed to come in contact with. Paying family members to provide services can also help reduce the burdens associated with unpaid caregiving – the mechanism which the LTSS service system is largely built upon – including caregivers' physical and emotional stress, poor health outcomes, and added financial costs (Gallanis & Gittler, 2012; Kunkel et al., 2003; Simon-Rusinowitz et al., 2005).

Almost all states also increased payment rates for services (90%) and implemented retainer payments (78%) to help keep providers in business and promote consistent, quality services for people with IDD. Retainer payments are beneficial to compensate for providers' loss in revenue and increase in expenditures during the pandemic. For example, in April of 2020, 32% of IDD service providers reported lost revenue due to closing service lines (Avalere Health, 2020). Moreover, overtime payments for staff have cost the average provider a million dollars a year during the pandemic (ANCOR Foundation & United Cerebral Palsy, 2021). Both increased

reimbursement rates and retainer payments can not only help providers maintain operations, as a result, they can also help ensure providers will be in business after the pandemic is over.

While increasing DSP wages is associated with reduced turnover (Pettingell et al., 2022) and was needed to compensate for DSPs' additional workload during the pandemic, when these temporary rate increases are removed, DSP turnover may increase, further exacerbating the systemic issue that is the DSP 'crisis' and in turn, hindering the quality of life of people with IDD (citation removed for review). It is also important to consider the implications of the modified staff qualification and training requirements on the quality of services and people with IDD's quality of life. Even prior to the pandemic, DSPs who provided the most support typically had the fewest qualifications, and there was little consistency in training guidelines or requirements across states (Hasan, 2013; Hewitt, 2014; National Direct Service Workforce Resource Center, 2013). Yet, staff training not only improves the quality of services, but also helps promote self-efficacy among DSPs, reducing burnout, and by extension, turnover (Hasan, 2013; Keesler, 2016).

Most states suspended people with IDD's HCBS Settings Rule right to have visitors of their choosing at any time. While this was likely done as a precaution to promote social distancing and reduce infection spread, doing so also contributed to increased loneliness and isolation among people with IDD, which can negatively impact people's mental health, especially during a traumatic and stressful time (ANCOR Foundation & United Cerebral Palsy, 2021; Embregts et al., 2022; Pettinicchio et al., 2021). In addition, from the Appendix K waivers, it was unclear if there were plans in place to fade these rights restrictions away as soon as was possible or if guidance given to providers on how best to do so.

While states made a wide number of amendments to their HCBS waivers for people with IDD during the pandemic, it was rare for states to expand people with IDD's opportunities for self-direction. While more research is needed to determine why so few states expanded self-direction during the pandemic, we theorize that states may have not prioritized self-direction either because of administrative burden and/or because they assumed self-direction would conflict with health and safety during the pandemic. However, it is important to note that self-direction is not only associated with more choice and control, but also with improved health and quality of life outcomes (Gross et al., 2013; Heller et al., 2012; Swaine et al., 2016). The lack of expansion of self-direction may also be due to low expectations about the abilities of people with IDD; in fact, while most HCBS waivers allow self-direction, even prior to the pandemic, states only aimed to have 10% of people with IDD receiving HCBS self-direct (citation removed for review). While fewer formal mechanisms for self-direction were expanded, the expansion of paying family caregivers may have helped increase the choice-making opportunities of people with IDD (San Antonio et al., 2006). Yet, people with IDD's ability to hire support staff outside of formal provider agencies using self-direction could have also helped compensate for DSP shortages.

In addition, relatively few states utilized emergency authorizations to expand access and eligibility for their IDD waivers; in fact, only 12 states increased cost limits, 6 states modified targeting criteria, and 2 states expanded the number of unduplicated people their waivers serve. A few states also suspended people with IDD's HCBS Settings Rule rights to choose where and with whom they lived. Given the significant infection and mortality rates of people with IDD in congregate settings (Chidambaram, 2022; Li, 2020), especially institutions, this seems like a missed opportunity to help people with IDD move from institutions to community-based settings

during the pandemic. Since HCBS waivers are more cost effective than institutions (Braddock et al., 2017), moving people with IDD to HCBS would not be cost prohibitive, and, therefore, likely not a reason for the lack of expansion. Perhaps states hesitated to expand the access and eligibility for HCBS IDD waivers due to a lack of community infrastructure to support people with IDD long-term, including after Appendix K waivers ended. In fact, as of 2020, 464,000 people with IDD were waiting for HCBS services (The Henry J. Kaiser Family Foundation, n.d.), highlighting the continued need to expand and strengthen the community infrastructure for people with IDD.

Implications for Policy and Practice

Prior to the COVID-19 pandemic, HCBS for people with IDD, while a critical mechanism, was underfunded, disjointed, and fractured (ANCOR Foundation & United Cerebral Palsy, 2021). While the pandemic has been extremely trying for people with IDD and taxing for the IDD service system, changes to service provision, such as the introduction of technology and the need to compensate the temporary closure of day programs, allowed many people with IDD to receive creative, person-centered services in ways never seen before (ANCOR Foundation & United Cerebral Palsy, 2021; Bradley, 2020; Scheffers et al., 2021).

Yet, Appendix K waivers are *temporary* amendments to state HCBS waivers. Many of the amendments to HCBS IDD programs found in this study are scheduled to revert to pre-pandemic operations 6 months after the Public Health Emergency (PHE) is terminated, unless approved by other authorities or implemented into the states' actual 1915(c) waivers. Given the changes made using Appendix K waivers aimed to promote the access, continuity, and quality of HCBS, we believe it would be beneficial for many of the changes made to waivers via emergency authorizations, such as introduction of telehealth, expansion of paying family

caregivers, increased reimbursement rates for DSPs, and increased flexibility in service provision, to continue.

Limitations

When interpreting the findings from this study, a number of limitations should be noted. The aim of this study was to examine how states changed their HCBS waivers using emergency authorizations during the COVID-19 pandemic; these data do not indicate if, or, how these changes affected the quality of life or quality of services of the people with IDD receiving HCBS. However, we believe this would be a fruitful area of future study. Given differences in population could not be determined, HCBS waivers that combined people with IDD with other populations were not included in this study. States may amend their Appendix K waivers multiple times; our analysis was of the cumulous changes states made between the beginning of the pandemic and our data collection (April 7, 2022). As the pandemic is ongoing, states may choose to amend, expand, or roll back these changes between when our data collection ended and the end of the pandemic.

Conclusion

The COVID-19 pandemic significantly impacted the HCBS IDD service system. Accordingly, during the COVID-19 pandemic, states made a large number of emergency amendments to their HCBS waivers for people with IDD using Appendix K waivers. These changes ranged from expanding where services could be provided to modifying provider qualifications, to increasing payment rates. The temporary changes made to HCBS IDD waivers aimed to ensure people with IDD's access to services and the quality of those services were maintained. It is important to ensure quality HCBS continue for people with IDD during the pandemic and well beyond.

References

Abrams, H. R., Loomer, L., Gandhi, A., & Grabowski, D. C. (2020). Characteristics of US nursing homes with COVID- 19 cases. *Journal of the American Geriatrics Society, 68*(8), 1653-1656. https://doi.org/10.1111/jgs.16661

ANCOR Foundation, & United Cerebral Palsy. (2021). *The case for inclusion 2021: A special report on the sustainability of community disability services in America*. https://caseforinclusion.org/application/files/2416/1376/5849/Case_for_Inclusion_2021_Special_Report.pdf

Anderson, M., & Perrin, A. (2017). *Disabled Americans are less likely to use technology*. https://www.pewresearch.org/fact-tank/2017/04/07/disabled-americans-are-less-likely-to-use-technology/

Annaswamy, T. M., Verduzco-Gutierrez, M., & Frieden, L. (2020). Telemedicine barriers and challenges for persons with disabilities: COVID-19 and beyond. *Disability and health journal, 13*(4), 100973. https://doi.org/10.1016/j.dhjo.2020.100973

Avalere Health. (2020). *Impact of COVID-19 on organizations serving individuals with intellectual and developmental disabilities*. American Network of Community Options and Resources (ANCOR). https://www.ancor.org/sites/default/files/impact_of_covid-19_on_organizations_serving_individuals_with_idd.pdf

Braddock, D., Hemp, R., Tanis, E. S., Wu, J., & Haffer, L. (2017). *The state of the states in intellectual and developmental disabilities: 2017* (11th ed.). The American Association on Intellectual and Developmental Disabilities.

Bradley, V. J. (2020). How COVID-19 may change the world of services to people with intellectual and developmental disabilities. *Intellectual and Developmental Disabilities, 58*(5), 355-360. https://doi.org/10.1352/1934-9556-58.5.355

Brown, K. A., Jones, A., Daneman, N., Chan, A. K., Schwartz, K. L., Garber, G. E., Costa, A. P., & Stall, N. M. (2021). Association between nursing home crowding and COVID-19 infection and mortality in Ontario, Canada. *JAMA internal medicine, 181*(2), 229-236. https://doi.org/10.1001/jamainternmed.2020.6466

Burns, M. E. (2009). Medicaid managed care and health care access for adult beneficiaries with disabilities. *Health services research, 44*(5p1), 1521-1541. https://doi.org/10.1111/j.1475-6773.2009.00991.x

Centers for Disease Control and Prevention. (2020). *Using telehealth to expand access to essential health services during the COVID-19 pandemic*. https://www.cdc.gov/coronavirus/2019-ncov/hcp/telehealth.html#print

Centers for Medicare and Medicaid Services. (2019). *Application for a §1915(c) Home and Community-Based Waiver [Version 3.6]: Instructions, technical guide, and review criteria*. https://www.hhs.gov/guidance/sites/default/files/hhs-guidance-documents/instructions_technicalguide_v3.6.pdf

Centers for Medicare and Medicaid Services. (2020). *Long-Term Services and Supports rebalancing toolkit*. Author. https://www.medicaid.gov/medicaid/long-term-services-supports/downloads/ltss-rebalancing-toolkit.pdf

Centers for Medicare and Medicaid Services. (n.d.-a). *1915(c) Home and Community-Based Services waiver instructions and technical guidance: Appendix K: Emergency*

preparedness and response. https://www.medicaid.gov/state-resource-center/downloads/1915c-appendix-k-instructions.pdf

Centers for Medicare and Medicaid Services. (n.d.-b). *Emergency preparedness and response for Home and Community Based (HCBS) 1915(c) Waivers*. https://www.medicaid.gov/resources-for-states/disaster-response-toolkit/home-community-based-services-public-health-emergencies/emergency-preparedness-and-response-for-home-and-community-based-hcbs-1915c-waivers/index.html

Chakraborty, J. (2021). Social inequities in the distribution of COVID-19: An intra-categorical analysis of people with disabilities in the US. *Disability and health journal*, *14*(1), 101007. https://doi.org/10.1016/j.dhjo.2020.101007

Chidambaram, P. (2022). *Over 200,000 residents and staff in long-term care facilities have died from COVID-19* Kaiser Family Foundation. https://www.kff.org/policy-watch/over-200000-residents-and-staff-in-long-term-care-facilities-have-died-from-covid-19/

Clift, A. K., Coupland, C. A., Keogh, R. H., Hemingway, H., & Hippisley-Cox, J. (2021). COVID-19 mortality risk in Down syndrome: Results from a cohort study of 8 million adults. *Annals of internal medicine*, *174*(4), 572-576. https://doi.org/10.7326/M20-4986

Dinesen, B., Nonnecke, B., Lindeman, D., Toft, E., Kidholm, K., Jethwani, K., Young, H. M., Spindler, H., Oestergaard, C. U., & Southard, J. A. (2016). Personalized telehealth in the future: a global research agenda. *Journal of medical Internet research*, *18*(3), e5257. https://doi.org/10.2196/jmir.5257

Dobransky, K., & Hargittai, E. (2016). Unrealized potential: Exploring the digital disability divide. *Poetics*, *58*, 18-28. https://doi.org/10.1016/j.poetic.2016.08.003

Embregts, P. J., van den Bogaard, K. J., Frielink, N., Voermans, M. A., Thalen, M., & Jahoda, A. (2022). A thematic analysis into the experiences of people with a mild intellectual disability during the COVID-19 lockdown period. *International Journal of Developmental Disabilities*, *15*(2), 168-196. https://doi.org/10.1080/20473869.2020.1827214

Ervin, D. A., & Hobson-Garcia, D. (2020). Community supports and COVID-19: Self-determination in a pandemic. *Intellectual and Developmental Disabilities*, *58*(6), 453-457. https://doi.org/10.1352/1934-9556-58.6.453

Gallanis, T. P., & Gittler, J. (2012). Family caregiving and the law of succession: A proposal. *University of Michigan Journal of Law Reform*, *45*(4), 13-12.

Gathright, J. (2020). *D.C.'s intellectually disabled residents face high rates of infection, and their caretakers are stretched thin*. https://dcist.com/story/20/05/12/d-c-s-intellectually-disabled-residents-face-high-rates-of-infection-and-their-caretakers-are-stretched-thin/

Gleason, J., Ross, W., Fossi, A., Blonsky, H., Tobias, J., & Stephens, M. (2021). The devastating impact of Covid-19 on individuals with intellectual disabilities in the United States. *NEJM Catalyst Innovations in Care Delivery*, *2*(2). https://doi.org/10.1056/CAT.21.0051

Gross, J. M., Wallace, L., Blue-Banning, M., Summers, J. A., & Turnbull, A. (2013). Examining the experiences and decisions of parents/guardians: Participant directing the supports and services of adults with significant intellectual and developmental disabilities. *Journal of Disability Policy Studies*, *24*(2), 88-101. https://doi.org/10.1177/1044207312439102

Hardy, M. A. (1993). *Regression with dummy variables*. Sage.

Hasan, S. (2013). *Will there be a direct support professional for me? Looking at what motivates DSPs [Unpublished Master's thesis]*. Humboldt State University.

Heller, T., Arnold, K., McBride, E., & Factor, A. (2012). Self-directed support: Impact of hiring practices on adults with intellectual and developmental disabilities and families. *American Journal of Intellectual and Developmental Disabilities*, *117*(6), 464-477. https://doi.org/10.1352/1944-7558-117.6.464

Hewitt, A. (2014). Presidential address, 2014—Embracing complexity: Community inclusion, participation, and citizenship. *Intellectual and Developmental Disabilities*, *52*(6), 475-495. https://doi.org/10.1352/1934-9556-52.6.475

Hüls, A., Costa, A. C., Dierssen, M., Baksh, R. A., Bargagna, S., Baumer, N. T., Brandão, A. C., Carfi, A., Carmona-Iragui, M., & Chicoine, B. A. (2021). Medical vulnerability of individuals with Down syndrome to severe COVID-19–data from the Trisomy 21 Research Society and the UK ISARIC4C survey. *EClinicalMedicine*, *33*, 100769. https://doi.org/10.1016/j.eclinm.2021.100769

Keesler, J. M. (2016). *An evaluation of individual and organizational factors in predicting professional quality of life among direct support professionals in intellectual/developmental disability services [Doctoral dissertation]*. State University of New York at Buffalo.

Krysta, K., Romańczyk, M., Diefenbacher, A., & Krzystanek, M. (2021). Telemedicine treatment and care for patients with intellectual disability. *International journal of environmental research and public health*, *18*(4), 1746. https://doi.org/10.3390/ijerph18041746

Kunkel, S., Applebaum, R., & Nelson, I. (2003). For love and money: Paying family caregivers. *Generations*, *27*(4), 74-80.

Landes, S. D., Turk, M. A., Formica, M. K., McDonald, K. E., & Stevens, J. D. (2020). COVID-19 outcomes among people with intellectual and developmental disability living in residential group homes in New York State. *Disability and health journal*, *13*(4), 100969. https://doi.org/10.1016/j.dhjo.2020.100969

Landes, S. D., Turk, M. A., & Wong, A. W. (2020). COVID-19 outcomes among people with intellectual and developmental disability in California: The importance of type of residence and skilled nursing care needs. *Disability and health journal*, *14*(2), 101051. https://doi.org/10.1016/j.dhjo.2020.101051

Lazar, J., & Jaeger, P. (2011). Reducing barriers to online access for people with disabilities. *Issues in Science and Technology*, *27*(2), 69-82.

Li, K. (2020, October 11). A crisis decades in the making: Disability housing policy and COVID-19. *Harvard Political Review*. https://harvardpolitics.com/congregate-care-covid/

Lund, E. M., Forber-Pratt, A. J., Wilson, C., & Mona, L. R. (2020). The COVID-19 pandemic, stress, and trauma in the disability community: A call to action. *Rehabilitation Psychology*, *65*(4), 313-322. https://doi.org/10.1037/rep0000368

Luterman, S. (2020). *The neglect of disability care*. The American Prospect. https://prospect.org/familycare/the-neglect-of-disability-care/

Matthias, R. E., & Benjamin, A. (2008). Paying friends, family members, or strangers to be home-based personal assistants: how satisfied are consumers? *Journal of Disability Policy Studies*, *18*(4), 205-218. https://doi.org/10.1177/1044207307311526

National Direct Service Workforce Resource Center. (2013). *Understanding your HCBS direct service workforce's strengths and preparing the workforce to serve all populations with*

core competency training [Paper presentation]. National HCBS Conference, Arlington, VA.

Nygren, M. A., & Lulinski, A. (2020). *State of the science on COVID-19 and people with IDD*. American Association on Intellectual and Developmental Disabilities. https://www.aaidd.org/docs/default-source/publication/state-of-the-science-on-covid-19-and-people-with-idd---dec-2020.pdf?sfvrsn=25893421_0

Pettingell, S. L., Houseworth, J., Tichá, R., Kramme, J. E., & Hewitt, A. S. (2022). Incentives, wages, and retention among direct support professionals: National Core Indicators staff stability survey. *Intellectual and Developmental Disabilities*, *60*(2), 113-127. https://doi.org/10.1352/1934-9556-60.2.113

Pettinicchio, D., Maroto, M., Chai, L., & Lukk, M. (2021). Findings from an online survey on the mental health effects of COVID-19 on Canadians with disabilities and chronic health conditions. *Disability and health journal*, *14*(3), 101085. https://doi.org/10.1016/j.dhjo.2021.101085

San Antonio, P. M., Eckert, J. K., & Simon-Rusinowitz, L. (2006). The importance of relationship: Elders and their paid family caregivers in the Arkansas cash and counseling qualitative study. *Journal of Applied Gerontology*, *25*(1), 31-48. https://doi.org/10.1177/0733464805282537

Scheffers, F., van Vugt, E., & Moonen, X. (2021). Assessing the quality of support and discovering sources of resilience during COVID-19 measures in people with intellectual disabilities by professional carers. *Research in Developmental Disabilities*, *111*, 103889. https://doi.org/10.1016/j.ridd.2021.103889

Schott, W., Tao, S., & Shea, L. (2021). COVID-19 risk: Adult Medicaid beneficiaries with autism, intellectual disability, and mental health conditions. *Autism*, *26*(4), 975-987. https://doi.org/10.1177/13623613211039662

Simon-Rusinowitz, L., Mahoney, K. J., Loughlin, D. M., & Sadler, M. D. (2005). Paying family caregivers: An effective policy option in the Arkansas Cash and Counseling Demonstration and Evaluation. *Marriage & Family Review*, *37*(1-2), 83-105.

Swaine, J. G., Parish, S. L., Igdalsky, L., & Powell, R. M. (2016). Consumers' and workers' perspectives about consumer-directed services in the United States. *Disability and health journal*, *9*(3), 464-471. https://doi.org/10.1016/j.dhjo.2016.01.002

The Henry J. Kaiser Family Foundation. (n.d.). *Medicaid HCBS waiver waiting list enrollment, by target population (2020)*. https://www.kff.org/health-reform/state-indicator/waiting-lists-for-hcbs-waivers/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D

Turk, M. A., Landes, S. D., Formica, M. K., & Goss, K. D. (2020). Intellectual and developmental disability and COVID-19 case-fatality trends: TriNetX analysis. *Disability and health journal*, *13*(3), 100942. https://doi.org/10.1016/j.dhjo.2020.100942

Warner, R. M. (2013). *Applied statistics: From bivariate through multivariate techniques* (2nd ed.). Sage Publications.

Young, D., & Edwards, E. (2020). *Telehealth and disability: Challenges and opportunities for care*. National Health Law Program. https://healthlaw.org/telehealth-and-disability-challenges-and-opportunities-for-care/

Table 1
Appendix K Waivers for HCBS 1915(c) IDD Waivers

State	Applicable IDD waivers	# Appendix K waivers	Effective date	End date
Alabama	AL0001, AL0391	5	1/27/2020	6 months after PHE
Alaska	AK0260, AK0262, AK1566	7	3/11/2020	6 months after PHE
Arkansas	AR188, AR936	6	3/12/2020	7/1/2022
California	CA0336, CA1166	8	2/4/2020	6 months after PHE
Colorado	CO0007, CO0293, CO0305, CO4180	14	3/10/2020	6 months after PHE
Connecticut	CT0426, CT0437, CT0881, CT0993	8	3/16/2020	6 months after PHE
Delaware	DE0009	5	1/27/2020	6 months after PHE
District of Columbia	DC0307, DC1766	5	3/11/2020	6 months after PHE
Florida	FL0867, FL40205	4	1/27/2020	6 months after PHE
Georgia	GA0175, GA0323	6	3/1/2020	6 months after PHE
Hawaii	HI0013	8	3/1/2020	6 months after PHE
Idaho	ID0076	3	1/27/2020	6 months after PHE
Illinois	IL350, IL464, IL473	3	1/27/2020	6 months after PHE
Indiana	IN0378, IN0387	10	3/1/2020	6 months after PHE
Iowa	IA0242	4	1/27/2020	6 months after PHE
Kansas	KS224, KS476	5	1/27/2020	6 months after PHE
Kentucky	KS0314, KS0475	5	3/6/2020	6 months after PHE
Louisiana	LA0361, LA0401, LA0453, LA0472	4	1/27/2020	6 months after PHE
Maine	ME0159, ME0467	8	3/1/2020	6 months after PHE
Maryland	MD0023, MD0339, MD1466, MD1506	9	3/1/2020	6 months after PHE
Massachusetts	MA0826, MA0827, MA0828, MA40207	5	3/1/2020	6 months after PHE
Michigan	MI0167, MI4119	3	3/1/2020	6 months after PHE
Minnesota	MN061	15	1/27/2020	6 months after PHE
Mississippi	MS0282	3	3/1/2020	6 months after PHE
Missouri	MO0178, MO0404, MO0841, MO4185	5	1/27/2020	6 months after PHE
Montana	MT0208	7	1/27/2020	End of PHE
Nebraska	NE0394, NE4154	6	3/6/2020	3/5/2021
Nevada	NV0125	5	1/27/2020	6 months after PHE
New Hampshire	NH0053, NH0397	3	3/1/2020	6 months after PHE
New Mexico	NM0173, NM0448, NM1726	6	1/27/2020	6 months after PHE
New York	NY0238	3	3/7/2020	3/31/2021
North Carolina	NC0423	6	3/13/2020	6 months after PHE
North Dakota	ND0037, ND0842	5	3/1/2020	6 months after PHE
Ohio	OH0231, OH0380, OH0877	5	1/27/2020	6 months after PHE
Oklahoma	OK0179, OK0343, OK0351, OK0399	16	1/27/2020	6 months after PHE
Oregon	OR0117, OR0375, OR40194	5	3/11/2020	6 months after PHE
Pennsylvania	PA0147, PA0235, PA0324, PA0354, PA0593, PA1486	21	1/27/2020	6 months after PHE
South Carolina	SC0237, SC0676	4	1/27/2020	6 months after PHE
South Dakota	SD0044, SD0338	7	1/27/2020	6 months after PHE
Tennessee	TN0128, TN0357, TN0427	3	3/13/2020	6 months after PHE
Texas	TX0110, TX0221, TX0281, TX0403	7	3/13/2020	End of PHE

Utah	UT0158, UT1666	4	1/27/2020	6 months after PHE
Virginia	VA0358, VA0372, VA0430	6	3/12/2020	6 months after PHE
Washington	WA0409, WA0410, WA0411, WA1186	11	1/27/2020	6 months after PHE
West Virginia	WV0133	6	3/12/2020	6 months after PHE

Note . PHE = Public Health Emergency.

Table 2

Emergency Amendments to HCBS IDD Waivers

Amendment	*N*	%
ACCESS AND ELIGIBILITY		
Increase cost limits for entry into the waiver	12	26.7%
Modify additional targeting criteria	6	13.3%
Increase unduplicated number of participants	2	4.4%
ASSESSMENTS AND PERSON-CENTERED PLANNING		
Modify processes for level of care re/evaluations	37	82.2%
Allow virtual/remote evaluations, assessments, and person-centered service planning meetings	32	71.1%
Allow extensions for reassessments/reevaluations up to a year	28	62.2%
Add electronic method of signing off on required documents	31	68.9%
Modify person-centered service plan development process	36	80.0%
SERVICES		
Add services to the waiver	23	51.1%
Add home-delivered meals	*9*	*20.0%*
Add medical supplies, equipment and appliances	*6*	*13.3%*
Add assistive technology	*5*	*11.1%*
Modify service scope or coverage	29	64.4%
Exceed service limitations or requirements	37	82.2%
Adjust prior approval/authorization elements approved in waiver	25	55.6%
SETTINGS		
Add remote/electronic service delivery	42	93.3%
Expand settings where services may be provided	42	93.3%
Allow for payment for services in acute care hospital or short-term institutional stay	31	68.9%
Provide services in out-of-state settings	14	31.1%
PROVIDERS		
Modify provider requirements	43	95.6%
Modify provider qualifications	*42*	*93.3%*
Modify provider types	*15*	*33.3%*
Modify licensure or other requirements	*29*	*64.4%*
Permit family caregivers/legally responsible individuals to be paid for providing services	28	62.2%
Authorize case management entities to provide direct services	13	28.9%
Institute/expand opportunities for self-direction	6	13.3%
REIMBURSEMENT AND RATES		
Increase payment rates	40	88.9%
Include retainer payments	35	77.8%
SAFEGUARDS AND OVERSIGHT		
Waive HCBS Settings Rule regulations about visitors	31	68.9%
Modify incident reporting requirements, medication management or other participant safeguards	31	68.9%
Other changes necessary to address imminent needs of waiver participants	43	95.6%

Table 3

State Changes to HCBS IDD Waivers

Amendment	AK	AL	AR	CA	CO	CT	DC	DE	FL	GA	HI	IA	ID	IL
ACCESS AND ELIGIBILITY														
Increase cost limits for entry into the waiver	X	X			X	X				X				X
Modify additional targeting criteria		X												
Increase unduplicated number of participants			X											
ASSESSMENTS AND PERSON-CENTERED PLANNING														
Modify processes for level of care re/evaluations	X	X	X	X	X	X	X	X		X	X	X	X	
Allow virtual/remote evaluations, assessments, and person-centered service planning meetings		X	X		X	X	X	X	X			X	X	X
Allow extensions for reassessments/reevaluations up to a year		X	X		X	X	X	X	X			X	X	X
Add electronic method of signing off on required documents		X	X			X	X	X	X			X	X	X
Modify person-centered service plan development process	X	X		X	X	X	X			X	X		X	X
SERVICES														
Add services to the waiver				X	X	X		X			X	X	X	X
Add home-delivered meals						X		X						
Add medical supplies, equipment and appliances								X						
Add assistive technology				X										
Modify service scope or coverage	X	X			X	X	X	X		X	X	X	X	X
Exceed service limitations or requirements	X	X			X	X	X		X	X	X	X	X	X
Adjust prior approval/authorization elements approved in waiver		X			X	X	X		X			X	X	X
SETTINGS														
Add remote/electronic service delivery	X	X	X	X	X	X	X	X	X	X		X	X	X
Expand settings where services may be provided	X	X		X	X		X	X	X	X	X	X	X	X
Allow for payment for services in acute care hospital or short-term institutional stay	X				X	X	X	X	X	X	X	X	X	X
Provide services in out-of-state settings					X	X				X				X
PROVIDERS														
Modify provider requirements	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Modify provider qualifications	X	X	X	X	X	X	X	X		X	X	X	X	X
Modify provider types		X	X		X	X		X						
Modify licensure or other requirements	X	X			X	X	X	X	X		X			X
Permit family caregivers/legally responsible individuals to be paid for providing services	X	X			X	X	X	X	X	X		X		X
Authorize case management entities to provide direct services		X		X	X		X					X		
Institute/expand opportunities for self-direction				X					X			X		
REIMBURSEMENT AND RATES														
Increase payment rates	X	X	X	X	X	X	X	X		X	X		X	X
Include retainer payments	X	X		X	X	X	X	X	X	X	X	X		X
SAFEGUARDS AND OVERSIGHT														
Waive HCBS Settings Rule regulations about visitors		X		X		X	X	X	X			X	X	X
Modify incident reporting requirements, medication management or other participant safeguards	X	X		X	X	X	X	X	X		X			X
Other changes necessary to address imminent needs of waiver participants	X		X	X	X	X	X	X	X	X	X	X	X	X

IN	KS	KY	LA	MA	MD	ME	MI	MN	MO	MS	MT	NC	ND	NE	NH	NM	NV	NY	OH	OK	OR	PA	SC	SD	TN	TX
					X							X			X					X			X		X	
	X			X	X							X			X											
					X																					
X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X			X	
X	X		X	X	X		X		X	X	X		X	X	X	X	X		X			X	X	X	X	X
	X		X	X	X		X		X	X	X		X	X	X		X					X	X		X	X
X	X		X	X	X		X		X	X	X		X	X	X	X	X		X			X	X	X	X	X
X		X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	
	X	X	X	X		X			X		X	X			X		X			X		X	X			
	X		X	X					X			X			X								X			
	X		X	X											X							X				
	X		X	X											X											
X		X	X	X	X	X		X	X			X	X	X	X		X	X		X		X	X		X	
X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X		X	X		X	X
X	X		X	X	X		X		X		X		X	X	X		X		X			X			X	X
X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
	X	X		X	X	X	X		X		X	X		X	X	X	X			X		X			X	X
			X	X	X							X	X	X	X			X		X						
X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
X	X	X		X							X			X					X		X					
X	X	X			X	X					X		X	X	X		X	X	X	X	X	X	X		X	
X	X		X		X	X		X	X		X	X	X		X	X	X		X			X	X			
	X		X				X				X		X		X		X									
		X				X														X						
X		X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
	X	X	X	X	X	X					X	X	X	X	X	X	X	X		X	X	X	X	X		
X	X		X	X	X		X		X	X	X		X	X	X	X	X		X			X	X	X	X	X
X	X	X		X	X	X	X			X	X	X	X		X	X	X	X		X		X	X		X	
X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

UT	VA	WA	WV
X		X	X
X	X		
X	X		
X	X		
X		X	X
X		X	
X		X	X
X			
X	X	X	X
X	X	X	X
X		X	X
		X	
X	X	X	X
X	X	X	X
X		X	
X	X		
X			
X	X	X	X
X	X	X	X
X	X		
X		X	
X	X	X	X