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Closing the Information Gap: Making COVID-19 Information Accessible for People with Disabilities

Sarah M. Anderson, MPH¹, Alina L. Flores, DrPH, MPH², Laura Z. Baldwin, MPH², Carolyn P. Phillips, M.Ed³, Jennifer Meunier, MPH²

¹CDC Foundation, College of Design, Georgia Institute of Technology

²Centers for Disease Control and Prevention, College of Design, Georgia Institute of Technology

³Center for Inclusive Design and Innovation, College of Design, Georgia Institute of Technology

Abstract

It is essential that people with disabilities have equitable access to COVID-19 communication resources to protect themselves, their families, and their communities. The Accessible Materials and Culturally Relevant Messages for Individuals with Disabilities project aimed to deliver essential COVID-19 information in braille, American Sign Language (ASL), simplified text, and other alternative formats, along with providing additional tools and trainings that people with disabilities and organizations that serve them can use to apply the COVID-19 guidance. Lessons learned from this project can be implemented in future public health emergencies as well as in general public health messaging for people with disabilities. This project, led by Georgia Tech's Center for Inclusive Design and Innovation (CIDI) and with technical assistance from the Centers for Disease Control and Prevention (CDC), was supported by the CDC Foundation, using funds from the CDC Foundation's COVID-19 Emergency Response Fund.

Keywords

COVID-19; accessible communication; American Sign Language; braille; simplified text; disability; public health

INTRODUCTION

The Americans with Disabilities Act (ADA) defines disability as “a physical or mental impairment that substantially limits one or more major life activity” (Americans with Disabilities Act, 1990). Additionally, the Rehabilitation Act of 1973 states that “disability

Corresponding Author: Sarah M. Anderson, MPH, 600 Peachtree Street, NE, Suite 1000, Atlanta, GA 30308, sanderson@cdcfoundation.org.

DECLARATIONS

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is a natural part of the human experience and in no way diminishes the right of people to live independently; enjoy self-determination; make choices; ... and enjoy full inclusion and integration into the economic, political, social, cultural, and educational mainstream of American society". Most people will either have a disability at one time in their lives or know someone who has one, making disability a part of who we all are as humans (CDC, 2018).

An estimated 61 million adults in the United States, or one in four people, report having at least one disability (Okoro et al., 2016). Prevalence differs by disability type, with mobility disabilities being reported as the most prevalent, followed by disabilities in cognition, independent living, hearing, vision, and self-care. Moreover, some adults report having multiple disability types concurrently. Disability types also vary by demographic and other factors. For example, Okoro et al. (2016) found that cognitive disabilities were the most common disability type among younger adults (ages 18–44 years), while mobility disabilities were the most common disability type among middle aged (ages 45–64 years) and older adults (ages 65 years). Additionally, a person with four or more disability types concurrently is more likely to live in poverty, have lower educational attainment, and to be seeking employment than an individual with a single disability type (Stevens et al., 2016).

Health information is not often accessible to nor inclusive of people with disabilities. For example, Nguyen et al. (2019) found that people with disabilities reported feeling frustrated while having to search for information, believing that it took a significant amount of effort to find health and medical services information. Identifying and utilizing mediums like telehealth or creating alternate formats can break through these barriers to care for and reach people with disabilities with critical health information, leading to a reduction in access disparities and movement toward achieving health equity. Widespread availability and use of internet-based and other electronic media enables quick and effective relay of health information to a broad audience, including people with disabilities, in a variety of accessible formats. However, gaps in access to the internet still exist, particularly in rural areas, and some people with disabilities experience more challenges with digital health communication due to the information not being in accessible formats (Werner & Shpigelman, 2019). Print media can be an effective tool and such products can be developed for people with basic or below basic literacy; however, print can be a barrier for people with cognitive, literacy, and vision challenges (NIH, 2018). Informational videos, narrated podcasts, and infographics can be used to communicate important health information in creative and visually appealing ways. Finally, informational products in braille and American Sign Language (ASL) can reach people who use these mediums to access critical health information.

The National Assessment of Adult Literacy (NAAL) reports that an estimated 90 million American adults lack literacy skills to support a "fully productive and secure life" (Berkman et al., 2010). Of those, an estimated 52 million American adults, regardless of disability status, have basic or below basic reading skills (NCES, 2017). Materials created for these individuals only require basic vocabulary knowledge where the reader is not required to understand the structure of sentences or paragraphs (NCES, 2017). Although some people with cognitive disabilities might have lower literacy than adults without cognitive disabilities, as a review by Geukes et al. (2018) indicated, there is minimal information

related to health literacy for this population. Between 500,000 and 2 million people who are deaf rely on ASL as their primary form of communication (Mitchell, 2006). According to the 2018 CDC Behavioral Risk Factor Surveillance System, approximately 13 million adults aged 18 years or older reported having a visual disability. Approximately 10% of people who are legally blind use braille (National Federation of the Blind, 2009).

Full civic participation is dependent upon people's ability to understand complex matters that require decision-making and action. These complex matters include health decisions, such as whether to get a vaccination or a health screening. Personal and public well-being depend on effective communication. It is essential that public health and health care communities support health equity by ensuring that timely, accurate, and accessible health information is available for people of all abilities. This is especially important during times of natural disasters, food recalls, pandemics, and vaccine development.

COMMUNICATING WITH PEOPLE WITH DISABILITIES IN THE TIME OF COVID-19

2019 Novel Coronavirus (COVID-19) was first detected in December 2019 and rapidly spread to become a global pandemic (CDC, 2020). Public health agencies at all levels engage in protecting the health of all populations. A critical aspect of this public health response is effective communication, two components of which Reddy & Gupta (2020) note as what information is being conveyed (content) and the communication platforms used to convey it (method). As noted in the World Health Organization's Strategic Communications Framework for Effective Communications (2017), when communicating about urgent health issues, both the content and platforms must be accessible, actionable, credible, relevant, timely, and understandable. Additionally, crisis communication, or communicating during a time of heightened worry, threat, or stress, such as the COVID-19 pandemic, requires "crafting communications that are concise and factual, compassionate, that instill confidence, and that evince organizational competence" (Auer, 2021). As a rapidly evolving health situation requiring multiple, and sometimes changing, messages, including mask wearing, physical distancing, hand hygiene, testing, and vaccination, among others, COVID-19 presents many communication challenges. For some people with disabilities, these challenges can be compounded by difficulties reading, seeing, hearing, and understanding health information that is not communicated in an accessible way.

Federal communications developed for people with disabilities are required to comply with Title II of the ADA and Section 508 of the Rehabilitation Act (USDOJ, 2020). Many requirements under Section 508 can benefit everyone, not exclusively people with disabilities. For example, adding captions to videos is necessary for people who are deaf or hard of hearing, but may also benefit anyone watching a video while there is background noise. Appropriate color contrast is necessary for people who have low vision but can also benefit everyone, such as when looking at an image on a screen when there is glare from the sun.

Although 508 requirements provide organizations with the guidance, they need to reach a broader audience, they fall short of providing guidance for full accessibility. Even with 508

requirements in place, people with certain disabilities or limitations might not be able to access, understand, or use critical information. For example, while health literacy guidance for web content provides recommendations for enhancing web accessibility, people without accessible technologies or who are blind and do not have access to braille might still be unable to receive important information (HHS, 2021). People with intellectual disabilities, who may not be able to understand guidance due to literacy level, are often also excluded. Finally, an important aspect of communication is that of diversity, representation, and inclusion in images and graphics (Gantman, 2020). In the same way that images represent people of different gender identities, ages, races, and ethnicities, so too should intentional consideration be given to ensuring representation of people with varying disabilities (HHS, 2021).

In March and April 2020, CDC's COVID-19 emergency response team had multiple listening sessions with disability organizations to assess how current health information was perceived and to determine what additional resources were needed. Organizations that serve people with mobility, cognitive, hearing, vision, self-care, and independent living functional disabilities were all included in assessment calls. There was a common desire and request across disability organizations to have COVID-19 content written at lower literacy levels than currently existed and that would be easier to read than the plain language that is required under the Plain Writing Act of 2010 (Plain Writing Act, 2010). There also were specific requests for content in ASL. Aside from accessible communication formats, groups shared ideas on how CDC could better include people with disabilities in scientific guidance as well as educate people with disabilities on how they might apply the guidance to daily life. To address accessible communication gaps during COVID-19, CDC and CDC Foundation partnered with the Center for Inclusive Design and Innovation (CIDI) at Georgia Tech on the Accessible Materials and Culturally Relevant Messages for Individuals with Disabilities project to address the communication needs of people with disabilities during the COVID-19 pandemic as well as disseminate best practices for future public health emergencies.

TARGET AUDIENCE AND RELEVANCE

This article provides information about the Accessible Materials and Culturally Relevant Messages for Individuals with Disabilities project, which created accessible COVID-19 materials for people with disabilities in braille, ASL, and simplified text as well as additional tools and trainings to support the implementation of COVID-19 prevention strategies. The COVID-19 pandemic has underscored the need for public health information that is relevant, understandable, and actionable by all people. People with disabilities are among the groups of people that have been disproportionately impacted by the COVID-19 pandemic (CDC, 2021), so ensuring that critical prevention and mitigation information is accessible and available to this audience in a timely manner is key. Information gathered during the project's needs assessment, message testing, and implementation phases is not only relevant for the ongoing COVID-19 public health response and in future public health emergencies, but also serves to inform general public health practices to ensure that all people have access to life-saving information.

This article is intended for a number of audiences. Public health professionals engaged in health education, health communication, policy and partnership development, and web development and design, can use the information from this article to ensure that their efforts are culturally relevant, accessible, and inclusive for people with disabilities and their caregivers. This article can also help to support organizations serving people with disabilities, including state and local health departments, to better communicate with their target audiences and facilitate outreach efforts. Lastly, the tools created through this project and the lessons learned can inform future research in health communications and accessible messaging for people with disabilities.

PROJECT OVERVIEW

The *Accessible Materials and Culturally Relevant Messages for Individuals with Disabilities* project, conducted June 22, 2020 to September 30, 2021, aimed to deliver essential COVID-19 information in braille, ASL, simplified text, and other alternative formats to people with disabilities, their families, and caregivers. The project also created additional tools and trainings, including a webinar series, to ensure that COVID-19 information could be applied by people with disabilities. Finally, best practices were shared through publications and trainings detailing how accessible communications can be implemented in future public health emergencies.

This project, led by CIDI, was a CDC Foundation-funded communications initiative to which the CDC was a technical advisor. Product creation and dissemination focused on three primary audiences:

1. people who are blind and use braille
2. people who are deaf or hard of hearing and use ASL
3. people who have intellectual and developmental disabilities who read or listen with understanding below a third-grade reading level and benefit from simplified text.

Two additional audiences were people with mobility limitations and caregivers of people with disabilities who may benefit from the accessible communications materials created through this project.

The project team effectively collaborated with a number of organizations that serve people with disabilities during all phases of development and implementation including the Center for Literacy and Disability Studies, Department of Allied Health Sciences, University of North Carolina at Chapel Hill (UNC), Deaf Link, Inc., and the American Association on Health and Disability (AAHD).

Importantly, the provision of COVID-19 materials in accessible alternate formats meets several principles of Inclusive Design, which aims to remove barriers and enable all people to participate equally. This is achieved by providing a comparable experience by placing people at the heart of the design process, acknowledging diversity and differences, offering choice where a single solution cannot accommodate everyone, and providing flexibility in

the way resources can be accessed (CABE, 2006). The outputs for this project are outlined in Table 1. Each project output is described in more detail below.

RAPID NEEDS ASSESSMENT

CIDI performed three extensive rapid needs assessments with people with disabilities from throughout the United States. This was a key first step of this project. These informative interview sessions were focused on gathering user insights regarding existing CDC COVID-19 guidance, while also identifying the need for accessible alternative formats for people with disabilities. This feedback and insight were gathered through an approach that included individual interviews, focus groups, and group interviews with people with disabilities from the project's three primary audiences (Table 1). The three communities that participated in the needs assessment had a wide range of functional abilities, which brought forth the diverse needs for accessible COVID-19 materials. Additional information was gathered from caregivers of people with intellectual and developmental disabilities as well as subject matter experts (SMEs) from more than 40 organizations serving people with disabilities. The needs assessment found that information must be provided in a variety of alternate formats to meet the unique needs of people within these communities.

Web Accessibility Evaluation

The CIDI team conducted web accessibility testing on 32 of CDC's COVID-19 webpages. These pages included the most widely used CDC COVID-19 pages and the most applicable materials used by or for people with disabilities and/or their caregivers as determined by the CIDI team. The web accessibility evaluation documented the types of accessibility issues in accordance with Health and Human Services Accessibility Compliance Checklists (HHS, 2021) and the W3C's international set of guidelines known as Web Content Accessibility Guidelines (WCAG) 2.1 Level AA (2018). Several "best practice" recommendations that fall outside of compliance-level conformance were also part of the evaluation, including feedback from people with disabilities during the needs assessment for the project. The evaluation was presented to CDC and the CDC Foundation in the form of a written report, a brief video showing how various Assistive Technology (AT) would access the pages, and an Excel spreadsheet with additional detail and remediation recommendations. These recommendations were categorized by level of impact and available capacity. Many of the suggested practices that were feasible in the midst of the COVID-19 pandemic were implemented.

ADAPTING CDC'S COVID-19 GUIDANCE INTO ACCESSIBLE FORMATS

Braille and Accessible Digital Files (Word Documents, PDFs, and Digital Braille-ready Files)

The needs assessment conducted for this project highlighted the need for embossed braille materials in addition to accessible digital versions of CDC's COVID-19 guidance. CIDI has a braille production group and is a member of the Braille Authority of North America (BANA). For this work, CIDI also collaborated with SMEs to create and distribute, via

mailed packets, verbatim CDC COVID-19 materials for people who are blind or have low vision.

While the braille documents were verbatim CDC guidance, which made adaptation simple, there were numerous concerns that needed to be addressed. Information in the COVID-19 pandemic was frequently evolving. It was important to take steps to ensure that materials embossed and mailed to participants were as “evergreen” as possible, so that they would not soon be out-of-date. When CDC guidance did change, the braille team worked to update Word document versions of the guidance and the Duxbury (braille-ready) digital files so that future embossed copies would be up-to-date. The embossed documents also included a statement that provided the source link for the CDC guidance, the date the CDC guidance was last updated, the date the guidance was embossed, and instruction that the most current information could be found on CDC’s COVID-19 website. This statement was added to promote trust among braille users that they were getting accurate information and allowing them, if possible, to seek current information online.

The braille team created braille versions of 54 of CDC’s COVID-19 guidance materials, which were available upon request on the microsite hosted by Georgia Tech (CIDI, 2021). The team also created packets of eight essential COVID-19 resources, as determined through input from the needs assessment and from SMEs. The packets were distributed nationwide through a variety of channels including partnerships with BANA and the Georgia Libraries for Accessible Statewide Services, a network library of the National Library Service for the Blind and Print Disabled. Partners were used for dissemination because they had existing mechanisms for distributing braille to braille users or because they served broad audiences of people who are blind or low vision. All braille was distributed at no cost to the user. As of May 11, 2021, over 46,000 pages of braille were disseminated across the country.

In addition to distributing embossed braille, the CIDI team posted 67 Word documents and CDC PDFs that were remediated for web accessibility to the microsite hosted by Georgia Tech. These materials were available for download for use with AT as well as for people to emboss braille themselves.

American Sign Language

The CIDI team was tasked with writing scripts for ASL videos that would address the concerns about health literacy, cultural relevance, and effective translation into ASL that were raised during the needs assessment and in conversation with partners. The CIDI team simplified several of CDC’s COVID-19 guidance pages to a fourth- or fifth-grade reading level. Wording and formatting that would help to facilitate accurate translation into ASL and effective captioning were also used. Two of these resources were initially filmed through a partnership with Deaf Link, Inc. and were message tested with deaf ASL users. Feedback was incorporated into future scripts, and CIDI created a total of 36 ASL scripts that served as the captions and transcripts for 36 ASL videos.

Although CIDI’s scope of work initially focused exclusively on English text script development, as CDC filmed and produced the videos, the team provided additional support during ASL video production. The CIDI team wrote several ASL “glossed” scripts, which

specify the signs and notations for the facial and body grammar that the interpreter should use. This glossed ASL resource was used on the teleprompter for the interpreter during video filming. Several interpreters chose to create glossed scripts for themselves, and CIDI offered support when requested.

Filming during the COVID-19 pandemic presented unique challenges. Some interpreters and staff were hesitant to film in person. A number of videos were filmed remotely to eliminate risk of COVID-19 spread, but it was difficult to ensure that the videos were of studio quality (adequate lighting, high-resolution cameras, access to a teleprompter, etc.) when they were filmed in the interpreters' home studios. In the end, the majority of the videos were filmed in person, in a studio, but not always at CDC's studio in Atlanta. With support from Deaf Link, Inc. and the Federal Emergency Management Agency (FEMA), a number of videos were filmed in studios in Texas and Washington, DC. Filming in the studio helped to ensure that the videos were completed efficiently and then could be edited by CDC staff.

In addition, partners shared that Certified Deaf Interpreters (CDIs), who are interpreters who are Deaf themselves, are preferred in the Deaf community compared to hearing interpreters. Although the majority of videos created through this project were filmed using CDIs, it was difficult to always use a CDI as there was a limited number who could film in person or who were able to film remotely with the correct equipment and support.

Based on feedback during the needs assessment and message testing as well as the CIDI team's years of expertise, the team provided a list of recommendations to ensure that the videos were easily accessible for ASL users. This included adding the ASL sign for the word "interpret" (✎) to the video title frame so that it was easily accessible in ASL as well as adding the ASL sign for "interpret" to CDC's COVID-19 website so that it was clear where ASL users could go to obtain content. CIDI reviewed a selection of the videos to provide feedback on signs used and the accuracy of the translation. CIDI also captioned the videos to ensure that the captions matched the signs and followed best-practice recommendations to improve comprehension (e.g., match the words with the signs, slowing the captions down, and including fewer words per line). The ASL videos included animated video titles so that viewers would be able to see the title in ASL and were linked to both the Georgia Tech microsite and the CDC COVID-19 homepage. CIDI also filmed an introductory video for the ASL video series that encouraged people to view the entire playlist.

GUIDELINES FOR MINIMIZING THE COMPLEXITY OF TEXT AND "EASY TO READ" MATERIALS

Efforts to address the communication needs of people who read or listen with understanding below a third-grade reading level, especially people with intellectual and developmental disabilities, were spearheaded by UNC's Center for Literacy and Disability Studies with support from the CIDI team. The first step was to create a set of guidelines for minimizing the complexity of text so that COVID-19 guidance was understandable to this audience. The UNC and CIDI teams began with a scoping review of the literature, which resulted in creation of the Guidelines for Minimizing the Complexity of Text (Center for Literacy and

Disability Studies, 2021). These evidence-based guidelines, which were refined throughout the course of this project, provided detailed guidance regarding text (word-level, sentence-level, and document-level); punctuation; layout; and the use of graphics, images, and icons. Examples from the guidelines included ensuring that 92% of the words are among the most frequently occurring words in written English, avoiding use of bullets, avoiding use of graphics unless necessary to support understanding, and avoiding use of negation entirely (Center for Literacy and Disability Studies, 2021).

These guidelines were then applied to 19 of CDC's COVID-19 guidance documents and communications materials, as determined by feedback gathered in the needs assessment and input from CDC SMEs. The materials were simplified using the guidelines to improve readability and to ensure that the overall reading level was below a third-grade level. Three "Easy to Read" documents were message tested with six people with intellectual and developmental disabilities as well as with their caregivers. Information from the message testing was applied to the simplified text documents and used to further refine the Guidelines for Minimizing the Complexity of Text. Some information gathered from message testing included that additional spacing between lines was needed and that images accompanying the "Easy to Read" materials did not improve understanding. For example, participants described images of people wearing masks or physical distancing as "funny," especially images without facial features, but could not describe the message that the image was supposed to convey. Given this and additional feedback, images were omitted from the "Easy to Read" materials.

Twenty-four "Easy to Read" materials were created and posted to CDC's COVID-19 website, with a button to the "Easy to Read" materials on the agency's COVID-19 homepage. As of March 18, 2022, the "Easy to Read COVID-19 Safety" page on CDC's website has had nearly 1.3 million views, demonstrating the great demand and need for these materials.

ADDITIONAL TOOLS TO SUPPORT PEOPLE WITH DISABILITIES WHEN APPLYING COVID-19 GUIDANCE

COVID-19 Webinar Series

Information gathered through the needs assessment, message testing, and discussions with internal and external project partners identified a number of gaps in COVID-19 information related to people with disabilities. Numerous partners and people with disabilities asked for additional information on topics such as how to effectively physically distance for people who are blind or have low vision, adaptations for wearing face masks for some people with disabilities, how best to clean durable medical equipment, and how businesses can safely reopen while considering the needs of employees and customers with disabilities.

The CIDI team hosted eight webinars in their COVID-19 Webinar Series to address some of these questions (Table 2). Webinar content was supported by technical assistance from CDC. Presenters included SMEs from CIDI, Tools for Life, Georgia Council on Developmental Disabilities, Southeast ADA Center, and the Center for Leadership in Disability. All

webinars were closed-captioned and information was signed by an ASL interpreter. The webinar recording, accessible presentation slides, and session transcript were all posted to the project microsite (CIDI, 2021).

Webinar invitations were sent to the project listserv, shared by project partners, and promoted on social media (Twitter, Facebook, Instagram, and LinkedIn). In total, 8,421 people registered for the webinar series, 3,670 participants attended the live webinar sessions, and 5,350 people have accessed the archived webinar content as of March 22nd, 2022.

COVID-19 Prevention Videos

The CIDI team, in consultation with UNC's Center for Literacy and Disability Studies, also created seven videos about COVID-19. Adults with intellectual and developmental disabilities were the primary audience for these videos, but many other people, with and without disabilities, may benefit. The videos featured people with disabilities and showed peer-to-peer demonstrations of key COVID-19 prevention strategies including wearing a mask, physical distancing, and getting a COVID-19 vaccine using simple language and visuals.

DISSEMINATION

Dissemination of resources was a key focus of this project to ensure that the tools reached the intended population groups. This project quickly built upon existing CDC Foundation, CDC, and CIDI's wide networks of relationships with disability-related organizations at federal, state, regional, and national levels.

The dissemination goal was primarily focused on rapidly getting the accessible COVID-19 guidance to individuals of all ages and disabilities throughout the United States. To accomplish this, CIDI worked with people, some directly and others through partners including AT programs; AT reuse programs; Centers for Independent Living; Area Agencies on Aging; Aging and Disability Resource Centers; University Centers for Excellence in Developmental Disabilities Education, Research, and Service (UCEDD); postsecondary Disability Student Services Providers; secondary schools; libraries; schools for deaf students; a wide range of disability advocacy organizations; and SMEs in the field of disabilities in all states and territories. Dissemination started with CIDI, CDC Foundation, CDC, and AAHD collectively identifying national organizations that serve the intended targeted audiences for the project or identifying individuals who are connected to these organizations by network affiliations. Organizations were invited to participate in an informational session about the project which highlighted opportunities for collaboration and project promotion. The project team then worked with more than 220 dissemination partners on a national level. Although numerous organizations were sharing information about the project through social media, email, and more, 25 national organizations were actively engaged in dissemination activities as key project partners.

In addition to disseminating the accessible COVID-19 materials, the project aimed to disseminate best practices for communicating with people with disabilities during public

health emergencies. CIDI and its partners conducted trainings for CDC staff about the communication needs of people who use ASL, people who use braille, and people who would benefit from “Easy to Read” materials. Issue briefs were developed to support CDC staff when creating accessible materials for people with disabilities and external partners, as well as internal communications.

CHALLENGES, LESSONS LEARNED, AND OPPORTUNITIES

The Value of Partnerships and Engagement with People with Disabilities

As with any project, but especially for projects focused on populations that have been historically marginalized and underrepresented, involving partners throughout the process is crucial as a matter of ethics and culturally informed inclusive practices to create the most effective and well-received initiative possible. This project emphasized the importance of involving people with disabilities and partners who serve people with disabilities at every stage of project development and implementation. Through the needs assessment, important information was gathered from SMEs as well as people with disabilities to inform communications product development. Without the information gathered at this stage, the topics of these materials and the formats created may not have met consumer needs and important considerations for how to ensure that these materials would be accessed by people with disabilities (e.g., adding the ASL sign for “interpret” to videos and web pages) would not have been incorporated. Message testing was also crucial to ensure that materials were accurately translated, culturally relevant, and accessible to people with disabilities. Feedback gathered was incorporated into the products, including increasing the spacing of text and determining not to use images in “Easy to Read” materials as well as adding information about the source and embossing date on braille products. Product dissemination would not have been possible without the efforts of partner organizations sharing information through their channels (e.g., mailing braille through partnerships with the National Library Service, additional organizations that know who needs access to braille materials) and informing the project team of best practices for sharing information (e.g., developing and circulating the ASL introduction video).

A number of new partnerships were established between CDC, CDC Foundation, CIDI, subcontractors (AAHD), UNC’s Center for Literacy and Disability Studies, and Deaf Link, Inc., as well as partners enlisted for dissemination (e.g., Georgia Libraries for Accessible Statewide Services). In addition to these specific partnerships, federal, state, and other public health agencies can also take steps to build partnerships now that will support future public health emergencies. Emergency planners can gather input from people with disabilities to be integrated into state and local emergency plans. Key contacts can be established to ensure that there are open lines of communication to support specific needs of people with disabilities that may evolve throughout a response and to support information dissemination. These relationships can be leveraged in future public health emergencies to gather additional input from people with disabilities as well as share crucial information with communities.

Addressing the Challenge of Rapidly-Evolving Information in an Emergency

Science and guidance from CDC were updated regularly during the COVID-19 pandemic, which posed unique challenges when creating accessible formats. It was important to take steps to ensure that embossed braille and recorded ASL videos, which are expensive to create and difficult if not impossible to edit after release, were not immediately out-of-date.

During material development, CIDI and CDC Foundation staff worked closely with CDC technical advisors to stay up-to-date on new guidance that would impact materials created through this project. Attempts were made to focus on information that would be as “evergreen,” or consistent throughout the course of the pandemic, as possible, although there was always a chance that guidance would need to be updated. Each accessible resource would refer consumers back to the CDC source guidance where the most up-to-date information could be found.

Even after initial products were developed and disseminated, updates to braille and “Easy to Read” materials were incorporated when the source guidance changed significantly. Additional measures were taken to make it easier to update ASL videos, if needed. ASL videos were filmed in a “modular format,” where sections of the video were divided by chapter headings displayed on the screen. This would make updating the videos easier in the future because a segment of the video could be cut out or re-filmed if needed without having to re-film the entire video.

Overcoming Additional COVID-19-Specific Obstacles

A number of challenges specific to the COVID-19 pandemic had to be overcome to effectively carry out this project. Filming ASL videos in person was difficult because interpreters and production staff were often wary of COVID-19 spread, but filming remotely also posed a number of challenges when it came to video quality. In the end, filming in person with support from partners led to the most efficient and high-quality videos, but at-home filming was possible if interpreters had the proper equipment (e.g., cameras, green screens, and teleprompters) and support. In future public health emergencies, having interpreters film from their homes may be useful to create stand-alone ASL resources or to add ASL to existing videos.

Although not unique to COVID-19, it is often difficult to write scientific information in plain language, and even more so if the information needs to be written below a third-grade reading level. Communication between COVID-19 SMEs and the project teams developing the “Easy to Read” materials was critical to ensure that the science was accurately reflected and the materials followed the Guidelines for Minimizing the Complexity of Text so that they could be understood by the target audience. Additional training and education for health communicators and public health practitioners on how to effectively simplify language can ensure that accessible materials can be developed early in future public health emergencies.

EFFECTIVE DISSEMINATION TO PARTNERS AND PEOPLE WITH DISABILITIES DURING PUBLIC HEALTH EMERGENCIES

This project reached people with disabilities and partners through numerous channels. CDC, the CDC Foundation, CDC, and CIDI shared information with national and local partners through email announcements on various listservs, press releases, articles, social media posts, webinars, and partner phone calls. Sharing the information through links to specific pages on Georgia Tech's microsite as well as CDC's website proved useful. For example, for people using ASL, the weblink to the ASL page would allow them to see the introduction video and animated video titles in one place rather than having to navigate to find each video on CDC's website or YouTube channel. As previously mentioned, partnerships were crucial for effective dissemination. People are more likely to use and apply information that they learn from sources that they trust. Building these relationships helped the project to use dissemination partners that already reached the target audiences.

ENSURING THE COMMUNICATION NEEDS OF PEOPLE WITH DISABILITIES ARE MET IN THE NEXT PUBLIC HEALTH EMERGENCY

This project highlighted several opportunities for education and awareness about people with disabilities and their unique communication needs among health care and public health professionals. Early inclusion of people with disabilities and disability partners is needed during emergency preparedness and response efforts, but many lessons learned from this project can be integrated into everyday public health communications and public health emergency preparedness planning. Using the Guidelines for Minimizing the Complexity of Text to ensure that information is accessible to people with limited literacy skills, creating ASL videos and embossed braille materials, and working to ensure that web materials are as accessible as possible to people using AT will not only ensure that people have access to information now, but can also promote trust with people with disabilities so that they look to public health agencies and organizations as reliable sources of information during an emergency.

This project was an opportunity to not only raise awareness about the importance of accessible health communications and specific considerations for people with disabilities within CDC and CDC Foundation, but also for external partners and audiences. Through the creation and dissemination of these materials, as well as through the trainings conducted as a part of this project, capacity was built that can be used in future public health emergencies at the federal level and can be applied at every level of public health institutions and organizations.

OVERALL OUTCOMES AND BENEFITS

When information is made accessible, everyone benefits. To prevent the spread of COVID-19, information about prevention strategies needs to be accessible for all people to protect themselves and their communities. The strategies and lessons learned from the Accessible Materials and Culturally Relevant Messages for Individuals with Disabilities

project can be applied to future public health emergencies and general practice to ensure that information is accessible and relevant to people with disabilities. Using partnerships established and maintained through this project can also support CDC, CDC Foundation, and other public health agencies and organizations to effectively obtain feedback from and disseminate information to people with disabilities and their caregivers.

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Table 1:

Project Outputs

Deliverables
Needs Assessment <ul style="list-style-type: none">• Rapid needs assessment with input from organizations serving people with disabilities• Focus group discussions and in-depth interviews with:<ul style="list-style-type: none">o People who are blind or who have low vision and use brailleo People who are Deaf or hard of hearing who use American Sign Language as their primary form of communicationo People who have intellectual and developmental disabilities who read at a third-grade reading level or below and their caregivers
Web Accessibility Evaluation of Select CDC COVID-19 Webpages
Guidelines for Minimizing the Complexity of Text
Adapting COVID-19 Guidance into Accessible Formats <ul style="list-style-type: none">• Braille• American Sign Language• “Easy to Read”• COVID-19 Prevention Videos
Message Testing with Disability Audiences <ul style="list-style-type: none">o People who are blind or who have low vision and use brailleo People who are Deaf or hard of hearing who use American Sign Language as their primary form of communicationo People who have intellectual and developmental disabilities who read at a third-grade reading level or below and their caregivers
Dissemination of Materials and Best Practices <ul style="list-style-type: none">• Trainings for CDC staff• Issue briefs• Webinar series• Partner dissemination
Evaluation <ul style="list-style-type: none">• Feedback from partners and people with disabilities• Web metrics of accessible COVID-19 materials, tools, and trainings• Number of materials disseminated• Report of lessons learned recommendations for future work

Table 2:

COVID-19 Webinar Series Presentations

Webinar Title	Date
Apps for Promoting Independence and Safety	November 12, 2020
Sanitizing of Personal Durable Medical Equipment	November 18, 2020
Face Masks and People with Disabilities	December 9, 2020
Mental Health & Resilience within the Disability Community During COVID-19	December 16, 2020
Making Social Media Accessible for People with Disabilities	January 20, 2021
Guidance for Businesses and Employers Considering the Needs of People with Disabilities During COVID-19	February 10, 2021
COVID-19 Vaccines for Caregivers and Personal Care Assistants (PCA)	May 12, 2021
FAQs About COVID-19 Vaccines that People with Disabilities Should Consider	May 26, 2021