



Leveraging Technology to Increase the Efficiency and Accessibility of Healthy Housing Services

Strategies for Rural Communities with Dispersed Populations

Rural and frontier communities are often geographically remote compared to their urban and sub-urban counterparts, posing challenges to accessing healthy housing services. Long distances and diverse terrain often make it more difficult and more costly for environmental public health and healthy homes professionals to conduct site visits, provide in-person services, and respond to issues in a timely way.

In addition, limited and unreliable internet service in rural and frontier communities frequently contributes to difficulties in both raising awareness of available services and identifying and accessing those who could benefit from them. Limited internet service can also impede the work of environmental public health professionals, such as their ability to access prior records and collect and maintain new data on environmental and healthy home factors. This barrier directly impacts the ability to identify environmental public health and housing trends and potential emerging threats that can affect public health.

Technology can offer solutions to some of the geographic barriers that environmental public health and healthy housing professionals experience in rural and frontier communities and enable them to serve geographically remote communities more effectively, enhance communication and data collection, and increase access to specialized workforce resources that are otherwise unavailable locally. In addition, there are existing technology solutions to address the historical challenges related to access to reliable broadband service in rural and frontier communities. Innovative programs can.

The following two strategies describe how to leverage technology in the field to increase efficiency, accessibility, and scalability of services in rural and frontier communities. The examples provided are not specific to rural communities but are strategies that can be considered and replicated in these communities. These are just two of the ways technology can be used by rural and frontier communities. Environmental public health and healthy housing professionals are encouraged to explore other ways to leverage technology to increase efficiency and accessibility.

Home Assessment and Inspection Applications

Home assessment and inspection software programs make digital documentation of property conditions during in-home assessments and/or inspections possible. These types of software programs are designed for mobile devices such as smartphones, tablets, or laptops, and are used by various professionals including community health workers (CHWs), occupational therapists (OT), environmental public health professionals, and others.

Professional home inspection reports and risk assessments can be generated by home assessment and inspection programs, reducing the time it takes to analyze and report data. Identifying software programs that allow users to document home hazards, upload photos, and produce reports could be beneficial to environmental public health and healthy housing professionals.

Examples

Many occupational therapy departments at colleges and universities utilize home and inspections programs to assist students in virtual and in-person home assessments.

- [Boston University](#), [Western Michigan University](#), and [Iona College](#) are some of the colleges and universities that have used a home safety assessments software designed for professionals working with the elderly and disabled populations.
- [Iona College](#) redesigned their in-person virtual home safety assessment projects to virtual assessments in response to the COVID-19 pandemic. Students used available software as a tool to assist in this effort.

With the use of home assessment and inspection programs, environmental public health and healthy housing professionals can quickly identify and annotate home hazards, communicate client-centric recommendations to remediate those hazards, and collect and store data in a centralized location.

Benefits

Home assessment and inspection programs are efficient alternatives to traditional paper forms because:

- Data can be manually or automatically uploaded, saved, and stored in one location, making it easier to track, retrieve, and analyze data.
- Programs can streamline the inspection process, allowing users to quickly record, analyze, and share data.
- Data can be entered directly into the program during the assessment, eliminating the additional step of transcribing paper forms.
- Detailed reports may be automatically generated which can reduce the need for manual report writing.
- Programs can include standardized procedures such as skip logic and required questions. Skip logic is a feature that changes what question or page a respondent sees next based on how they answer the current question. Required questions instruct respondents to answer the questions before continuing to the next page. These features help ensure that all necessary questions are answered and reduce the likelihood of human error.
- Some programs allow users to take, upload, transmit and store photos of home hazards.
- Some programs allow home visitors to access information from previous visits to the home or with the individual at a different residence.
- Some programs can be customized to focus on specific healthy homes and environmental health topics and needs.

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- Some programs allow users to enter data offline with the ability to upload forms and data once broadband service is available, which could be ideal for rural and frontier communities where internet access may not be available or reliable.

Limitations

Home assessment and inspection programs have some limitations.

- Not all programs are compatible with every device, which can limit use.
- Devices may fail, lose batteries, or have hardware issues that may affect the assessment process.
- The assessment process may be interrupted by software updates or maintenance.
- Some programs may require internet access for data collection and syncing, which may not be available in some rural and frontier communities.
- Users will need to be trained to effectively use a program, which will require resources and time; however, this training can be integrated with general healthy homes assessment training.
- There may be a cost associated with program purchase, maintenance, soft updates, and support.
- A phone or laptop may need to be purchased for staff conducting visits.
- Loss or theft may be a risk when carrying devices out into the field.

Virtual Home Assessments

If broadband service is not a deterring factor, virtual home assessments can be used to evaluate the safety and health of a home from an office using virtual conferencing apps such as GoToMeeting, Teams, Zoom, and Skype. Residents can use these apps to give a virtual tour of their home and identify potential hazards. During the COVID-19 pandemic, virtual home assessments emerged as an innovative way to recommend and provide advice, resources, and services safely to residents. Virtual home assessments can help environmental public health and healthy homes professionals identify potential contaminant exposures and health hazards and provide residents with necessary information and recommendations for improvements.

Examples

[Isles, Inc.](#), a community development and environmental organization in Trenton, New Jersey, established a hybrid lead and healthy homes assessment program in response to COVID-19. The Isles' staff performs indoor lead and healthy homes assessments using video phone apps such as FaceTime, GoToMeeting, and Skype. During the lead and healthy homes assessment, community health workers (CHWs) assess the exterior of the home and test sills and other wood surfaces for lead. After the assessment, while on video with the CHW, residents use Isles' visual assessment form questions to identify issues in each room while walking around their home, such as musty smells, clutter, deteriorating paint, water intrusion, and pest signs,. In addition to conducting surveys, the CHWs educate the residents about any problems they discover. CHWs also use other programs such as DocuSign and CamScanner to help residents complete applications and.

Children's Mercy Kansas City's Healthy Homes Program has [environmental health specialists](#) who perform healthy home environmental assessments including a virtual visual assessment. The [Healthy Homes Program](#) staff developed a revised home assessment flow chart and protocol for the virtual assessments.

Green & Healthy Homes Initiative (GHHI) developed the [Virtual Healthy Homes Toolkit](#) for other organizations to use, free of charge, to adapt in-person healthy housing services to the virtual setting. This toolkit provides resources including operational protocols, best practices, and data management planning.

Benefits

Virtual home assessments are efficient alternatives to in-person assessments when broadband is available. Virtual assessments:

- Allow professionals in other communities to conduct assessments if the workforce is not available locally.
- Can protect the wellbeing of residents and staff when health or safety is a concern (ex: if a resident has an infectious or transmittable illness).
- Can increase accessibility by providing homeowners in remote areas such as rural and frontier communities access to assessments.
- Can allow environmental public health and healthy housing professionals to serve larger geographic regions; however, this may also increase workload.
- Could reduce the need for travel which can reduce the cost associated with home assessments.
- Do not require significant investments in new hardware for staff.
- May be preferred by some residents, which may increase access to homes that typically do not permit or prefer in-person services.

Limitations

Virtual home assessments can have technology challenges, due to the reliance on it, including:

- Limited reliable Internet access.
- Lack of technology (e.g. computer, smartphone) or familiarity with video conferencing among residents.
 - A potential option to address this barrier is to provide residents with a device prior to the assessment.
- Staff time to work with residents to assist with technology.
- Requirements to download technology (e.g. video conferencing app.)

In addition to potential technical issues, virtual assessments are only visual. This limits professional's ability to capture and identify every aspect of the home's condition, such as musty smells that could indicate the presence of mold, loose step, air quality etc. An option to mitigate this barrier is to provide kits for residents with guidance or instructions to do their own sampling.

The Children's Mercy Kansas City's [Healthy Homes Program](#) outlines other benefits and challenges experienced with the virtual home assessments.

Opportunity for Action

Incorporating technology into environmental public health services presents a significant opportunity to address the unique challenges faced when providing healthy housing services to rural and frontier communities. By leveraging home assessment and inspection applications, as well as virtual home assessments, professionals can enhance efficiency, accessibility, and scalability of healthy housing services. These technological solutions allow for comprehensive data collection and streamlining processes, enabling timely responses and informed decision-making.

Opportunities exist now for environmental public health and healthy housing professionals to embrace these strategies, invest in the necessary training, and advocate for improved

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broadband infrastructure to fully utilize these technological tools. These strategies can help ensure that all communities, regardless of their geographic location, have access to safe and healthy living environments. Harnessing the power of technology can create lasting, positive impacts on public health in rural and frontier areas.

About this Partnership

The National Center for Healthy Housing (NCHH) and the National Environmental Health Association (NEHA) are partnering to improve healthy housing and environmental public health in rural and frontier communities. Our intention is to gather information about the current state of healthy housing and environmental public health; collaborate, unite our strengths, and identify solutions and unique strategies to improve public health outcomes in rural and frontier communities.

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