

Centers for Disease Control and Prevention Division of Strategic National Stockpile

Report of Findings

*Prepared for the Centers for Disease Control and Prevention
Division of Strategic National Stockpile*



Dispensing Site Pictogram Research

Submitted by:
Jane Mobley Associates
116 W. 3rd Street
Suite 102
Kansas City, MO 64105
(816) 472-1930
(816) 472-1926 fax
www.janemobley.com



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I. BACKGROUND

The Centers for Disease Control and Prevention's (CDC's) Division of Strategic National Stockpile (DSNS) oversees a national repository of antibiotics, chemical antidotes, antitoxins, vaccines, and other life-saving medications. During a public health emergency, state and local public health systems may be overwhelmed. The SNS is designed to supplement and re-supply state and local public health agencies in the event of such an emergency, anywhere and at anytime, within the United States or its territories. The DSNS also provides technical assistance to local officials ensuring that capacity is developed at federal, state, and local levels to receive, store, stage, distribute, and dispense DSNS assets.

Stockpile assets have been used to increase preparedness for national security events, such as political conventions and elevated terror threat levels. Assets have also been deployed to respond to the terrorist attacks on September 11, 2001, and to the anthrax attacks that followed the same year.

In 2006, DSNS determined the need for initial research to explore opportunities to better meet the needs of special and vulnerable populations at dispensing sites. In particular, limited English proficiency (LEP – to include persons with limited or no English and low literacy) populations in the United States that might be challenged by printed signage at a dispensing site and persons who are deaf and hard of hearing may experience difficulty with spoken instructions.

Jane Mobley Associates (JMA) was awarded a contract to conduct qualitative research on the use of picture-based signage or pictograms to communicate critical health or health-related information. JMA's background includes research, product development, and implementation of communication initiatives targeted to special populations for the Centers for Disease Control and Prevention, state public health departments, regional Urban Area Security Initiative (UASI) working groups, and local jurisdictions.

Project research was conducted from April to August 2006. This report summarizes research findings and initial recommendations for consideration by DSNS staff in meeting the needs of special populations at SNS dispensing sites.

II. DESCRIPTION OF THE RESEARCH PROCESS

The research conducted for this project provides a representative overview of emerging information regarding picture-based communication for health, emergency, or disaster situations as well as the emergency communication needs identified by special populations and service providers who work with these population groups. The research process included four primary activities:

1. Review of representative current literature
2. Subject matter expert consultation
3. One-on-one interviews
4. Focus group discussions

Literature Review

Preliminary research included a literature review to identify new and emerging research or recommendations regarding the use of pictograms for emergency or health communication. Primary research topics that guided the literature review process included existing symbols, pictograms, and illustrations in use; processes for developing effective symbols and forms of communication for special populations; pictograms for conveying safety and emergency information; identified communication needs of special populations; and barriers to communicating with special populations. Literature sources included industry-specific journals, online articles and resources, Web sites, and DSNS staff recommended research reports. A complete listing of sources reviewed is included in Appendix A.

Subject Matter Expert Consultation

The research team consulted select subject matter experts to provide an understanding of message content for reaching special populations and to seek advice on symbol or picture styles for testing and comparison purposes. Information from the consultations informed the team on the development of the focus group discussion guide and one-on-one interview questions. Subject matter experts included professionals familiar with the needs of individuals who are English as a second language (ESL) speakers, low literacy, and deaf or hard of hearing. A list of subject matter experts consulted and affiliations is included in Appendix B.

One-on-One Interviews

A series of one-on-one interviews was conducted with professionals serving LEP populations or advocating on their behalf. These professionals and advocates were able to discuss overarching needs of identified LEP populations and how those needs could be better met at an SNS dispensing site. Interviews were scheduled in advance and conducted by telephone and online. Interviewees included professionals representing local, statewide, and national organizations, including the Jewish Vocational Service of Kansas City, Mo.; Office for International Affairs, Louisville, Ky.; National Center for Family Literacy; Minnesota Literacy Council; and the Comprehensive Adult Student Assessment System (CASAS). The same series of questions was presented to each interviewee. The interview questions and list of interviewees are included in Appendix C.

Focus Group Discussions

In order to obtain a sampling of opinions regarding picture-based communication, the research team conducted focus group discussions with members of LEP and deaf and hard-of-hearing populations and representative service providers and advocates for these population groups. The purpose of the focus group discussions was to explore message content and comparison of symbols, illustrations, and photograph styles for pictograms. The nature and format of the focus group questions generated data that revealed communication preferences of special populations in regard to picture-based communication as well as recommendations for the planning and development of pictograms for SNS dispensing sites.

The research team conducted a series of six focus groups with LEP and deaf and hard-of-hearing individuals at service provider and ESL education facilities in Kentucky and the Midwest region. Participants representing LEP populations originated from such countries as Bosnia, China, Vietnam, Mexico, Libya, Pakistan, and Japan and had lived in the United States from a few months to several years. Key service providers of LEP, low literacy and deaf and hard-of-hearing populations assisted in the scheduling and recruitment of focus group participants. Each focus group discussion lasted approximately one-and-a-half to two hours. The focus group discussion guide and participant profiles are included in Appendix D.

The development of the focus group discussion guide was based on input and recommendations from DSNS staff regarding the most common terminology required for dispensing sites, which included a list of basic messages and common terminology to test in the focus groups. This information, coupled with the findings from the literature review and subject matter expert interviews, allowed the research team to compile a number of symbols and pictures for testing. A set of images tested in focus group discussions is included in Appendix E.

III. SUMMARY OF FINDINGS AND RECOMMENDATIONS

Research findings provide to DSNS a baseline of information that can inform decision making as the Division moves forward in planning to address the needs of special or vulnerable populations at a dispensing site.

Overall, research findings indicate that pictograms can have a number of advantages when communicating critical health information, although not a guaranteed solution.

Key Findings

- Pictograms are more noticeable than come written messages/signs.
- They have the potential to overcome some of the communication barriers experienced by persons who cannot read or understand spoken English well.
- Visual material is readily learned, and pictograms show potential for providing a means of public education.
- Very few pictograms are universally understood and even those that are well understood are not always interpreted correctly by all groups.
- It can take years for a pictogram to reach maximum effectiveness.
- Pictograms alone – without any text – tend to be less effective. Pictograms may be employed as a strategy to avoid translation of messages into multiple languages, but by identifying at least the top one or two languages spoken in a geographic area and adding limited text translation to a pictogram, message comprehension can be improved.
- Rarely could a pictogram or series of pictograms be expected to achieve a high level of communication effectiveness without some accompanying public education component. All research activities indicated a need to provide multiple exposures to pictograms along with an education component that would allow the general public and special populations to have encountered messages prior to arriving at a dispensing site under emergency circumstances.

Recommendations

As DSNS moves forward in determining the need and potential use of pictograms as part of way-finding and instruction at points of dispensing, the following recommendations could apply. The first and most important recommendation would be the need for further research. Since the data gathered in this research effort was qualitative in nature, findings are not to be represented as statistically significant or conclusive and *further research would be required* to make such program or policy actions. The focus group discussions and one-on-one interviews seek to develop insight into common terminology required for

dispensing sites and the corresponding symbols and pictures that most successfully communicate that terminology. While the results are indicative of shared opinions and attitudes, the sample size of this type of research preclude definitive conclusions.

Additional recommendations include:

- Assess the time, cost, and testing required for development of pictograms
- Estimate the time for message adoption
- Assess training requirements (DSNS staff, state staff)
- Identify potential critical message confusion
- Appraise likely effectiveness
- Estimate life expectancy of messages
- Evaluate other routes for reducing text required in multiple language messages
- Include target populations on design team if pictograms are developed
- Consider design preferences of different target populations (Design preferences did emerge in this research, including the desire for negative white space; illustrations preferred over photos; and contrasting colors.)
- Establish national standards for use at points of dispensing throughout the United States

IV. DETAILED FINDINGS

Literature Review

The literature review served primarily to benchmark some representative research already conducted in the health field and other fields as it related to the use of pictograms for communication purposes. This review sought to identify common terminology or symbols already identified by DSNS or already in use in the field. A complete list of resources reviewed is included in Appendix A.

Pictograms can have a number of advantages when communicating critical health information. They are more noticeable than some written messages, particularly when being viewed from a distance. Pictograms can also improve comprehension for those with limited English language proficiency or low literacy levels. Generally, pictures can assist in greater recognition and recall of messages and can serve as instant reminders.

At the same time, few pictograms are universally understood and even those that are well understood are not always interpreted correctly by all groups. It takes many years for a pictogram to reach maximum effectiveness. Pictograms are affected by size, positioning, and clutter in relation to the surrounding environment. They are not a guaranteed solution to understanding the message.

To maximize effectiveness, the following principles would apply:

- Pictograms are best used for simple messages.
- The longer a pictogram is in circulation, the more effective it will be – no pictogram is instantly effective.
- Pictograms must be tested extensively (qualitative, quantitative), contextually, cross-culturally, and with special populations.
- Visual material is readily learned – pictograms should be selected partly on the basis of how easily they can be learned and not only on how well they are comprehended when first seen.

Design considerations:

1. Color (e.g., red = danger)
2. Shape (e.g., pointed shapes can signify hazards more effectively than circles)
3. Negation Symbols (can include double cross, such as railroad crossings, the single line-through in front of negated information, or the single line-through behind the negated information)
4. Signal Words (e.g., danger, warning, caution)

5. Explicitness
6. Order (comprehension can be increased when the pictogram is positioned above the corresponding text.)
7. Alternate Forms

Recommendations

As DSNS moves forward in determining the need and potential use of pictograms as a part of way-finding and instruction at points of dispensing, a few recommendations are pertinent.

- Evaluate the need
- Assess time, cost, testing (for development of pictograms)
- Estimate time for message adoption
- Assess training requirements
- Identify potential critical confusion
- Appraise likely effectiveness
- Estimate life expectancy of message
- Evaluate other routes for reducing text required in multiple languages
- Establish national standards for use at points of dispensing throughout the United States

Subject Matter Expert Consultation

The project team consulted subject matter experts, such as the executive director of Collaborating Agencies Responding to Disasters and course instructor for Disaster Preparedness for Special Populations at the University of California, Berkeley and the program manager from the Comprehensive Adult Student Assessment System (CASAS). The consultants indicated that communicating critical messages with the use of pictures or illustrations accompanied by limited words would be most effective in communicating with special populations.

Representative comments included:

Pictures without any words become a Rorschach test – subject to too much interpretation. Pictures with words are preferred.

I think the use of pictures accompanied by limited, simple vocabulary is the most effective.

While the use of pictures or illustrations are most critical for individuals with no verbal communication skills and/or ability to read print and those who are deaf and preliterate, using pictures accompanied with limited words increases the likelihood that the information will address more individual needs.

Research conducted by the CASAS showed positive learning gains for learners of the English language who used the picture cues on CASAS assessments.

Opinions were mixed in terms of the types and styles of pictograms that would be the most effective in meeting the communication needs of special population groups. Overall, the professionals agreed that the use of color could impact the comprehension of the message conveyed in certain pictures or images.

Representative comments included:

The types of pictures that could be more effective in communicating with special populations greatly depends on what needs to be communicated and what is being shown in the image, as well as the relationship of the messenger to the audience.

I think the use of real-life pictures is most effective. Pictures that show what people encounter in their daily life make the instructional situation more tangible. For some things, color will make or break the message, unless the graphics are designed specifically to compensate for the lack of color. Example: using checkers, stripes and wavy lines in bar charts when color is not used helps greatly with comprehension, visual appeal, etc.

I think color is important, especially if the emphasis is using photographs to depict daily life situations. CASAS has done a study for those with cognitive disabilities showing that color photographs significantly increase learning gains on assessment compared to black-and-white line drawings or illustrations.

Subject matter experts recommended several strategies for public education and outreach that could be implemented in advance of special populations relying on picture-based communication at a Point of Dispensing (POD). Recommended strategies for education and outreach included:

- Use **TRUSTED** service providers as the creation partners and distribution mechanism. I would be happy to share the millions of reasons why this is not just recommended, it is virtually required if you want **LASTING** success.
- Remove all fear-based messages. Test the market with **TRUSTED** service providers for the targeted community. Use a multimedia approach.
- Public awareness campaigns and public service announcements in target languages (in the newspaper, radio, television, local places of worship, and gathering – like restaurants and community centers) may be effective methods to get the word out. These advance announcements could include pictures for those with certain disabilities and for those who are not literate in any language.

Advice was also offered for the early phases of picture-based communication planning to meet the needs of the special populations groups. Representative comments included:

*Understand that diverse communities actually have very different needs. Simply translating materials into other languages or pictures is problematic. To translate materials that **DID NOT** successfully prepare or serve the middle-class American audiences it was created to serve is wasteful.*

People with Limited English Proficiency (LEP) have a range of unique considerations. Preparedness needs (for example) include, but are not limited to: personal medical information written in English and native language for both civilian/citizen and professional responders; bi-lingual emergency contacts (lest they be out of important loops); knowledge of the community resources available where their language is supported, etc. Obviously, Spanish speakers from Cuba have different levels of comfort with the American government and have different expectations for disaster response (Cuba mobilizes VERY effectively for hurricanes, for example). Levels of acculturation will impact understanding and trust of all messages. Government, the Red Cross and other response agencies take lists designed for healthy, middle-class Americans, who mostly trust the messenger and just translate it into multiple languages. This is why your work on this issue is so very important!

For diverse communities, the messenger can be much more important than the message. Much.

Even a simple message, such as “go to your doctor” has wildly different interpretations. For poor people, it can be a trip to the emergency room. For some, this message will just be ignored. For others, it is over-the-counter medicines or nothing. For followers of Traditional Chinese Medicine (TCM), it means a visit to their acupuncturist or herbalist. With insurance, it means something else.

I think it is important to know the community you are going to target; region of the country; ethnic mix of the communities; cultural attitudes about doctors and medical facilities; culture-bound attitudes about various diseases and how they are contracted; and what the implications might be in the family. Also, health care professionals can participate in advance training sessions and/or be given literature regarding communication needs of persons with disabilities.

One-on-One Interviews

The detailed findings from the one-on-one interviews have been organized by questions asked in all interviews. For a complete list of interviewees, refer to Appendix C.

- **Do you have any knowledge of previous experiences the population you serve may have already had with picture-based communication?**

Many respondents had knowledge of previous experiences the population groups they served had with picture-based communication. Opinions were mixed on whether these experiences were positive or negative, but most respondents indicated the experiences were positive overall. Representative comments regarding experience with picture-based communication included:

- *Refugee clients have been exposed to picture-based communication in ESL classes, driver's education, financial and computer literacy trainings as well as in normal daily tasks, such as shopping at the grocery store.*
 - *Many of the people who take an ESL class will have experience in "reading images."*
 - *Most of our students are college-bound students or preparing to enter graduate school. I believe they all have prior experience with picture-based communication.*
 - *The learners I work with have used picture-based communication in the classroom for a variety of topics. I try to have as many visuals as possible available. My feeling is that this would be true for a great number of teachers/tutors in and around Minnesota. In the teacher/tutor trainings I facilitate, including health literacy, I strongly suggest using visuals and/or gestures. In my experience, the result is overwhelmingly positive. It cuts down on frustration and misunderstandings.*
- **Please share your opinion about communicating critical messages with the use of pictures or illustrations alone, versus those accompanied by limited words.**

Respondents almost universally agreed that communicating critical messages through the use of pictures or illustrations accompanied by limited words is the most effective communication approach to reaching special populations. Representative comments include:

- *The use of pictures or illustrations accompanied by limited words seems to be the best approach. Most non-English speakers know at least a few key words of English. If those words were written as well as communicated vocally refugee clients would be in a better position to respond appropriately.*
- *I think pictures may not be enough when critical information needs to be communicated.*
- *Pictures/illustrations with a few attached words will be more effective and easy to follow, like some traffic signs.*
- *My education background is with special needs children and their families and the uses of picture communication is very common and useful when working with this population. I think that picture communication would be very effective with low-level literacy adults and children. In family literacy we are focused on building literacy skills; however, the uses of words and pictures in a stressful situation can mean the difference between life and death. The uses of pictures*

and words would be effective for families as a whole because they may have diverse literacy skills among adults and children.

- *I'm critical of written information. Too often it is gobbledygook – as if written by a spell-check rather than someone familiar with the language. Pictures can be helpful, but if accompanied with text, then the correct words are critical and must be geared to the particular population; i.e., the Mexican language is different from the South American or Cuban language.*
- *I would advocate for using pictures accompanied by words. It is valuable for non-native speakers to hear the words while seeing a visual or demonstration, etc. What I would really advocate for, however, is visuals with limited words WITH demonstration.*

- **Based on the communication needs of the population group/s you work with, are there types of pictures that you believe could be more effective, e.g., photographs, basic diagrams, or illustrations**

Opinions were mixed in terms of the types of pictograms or illustrations that would be most effective in communicating basic messages with special populations groups. Most respondents recommended the use of simple pictures that are representative of the target audience in terms of the community and people depicted. Representative comments included:

- *Illustrations can be drawn in a simple manner, which provides clarity that may not be duplicated by diagrams or photographs.*
- *Photographs.*
- *Pictures that represent the community and environment that the people live in would be most effective. The use of the languages common to the region should also be considered.*
- *I think pictograms are excellent if they are simple. Also, adding “some” text is okay.*
- *Whether photographs or illustrations, keep them simple and stay away from busy visuals and overly stylized pieces. Also, people need to be aware that there may be some individuals who have a hard time comprehending a two-dimensional representation of an object or person. These people tend to be illiterate or pre-literate. For example, an individual who can easily point out a quarter from a pile of change on the table cannot point out a picture of a quarter from among pictures of other coins. Also, many people have sight problems – either trauma to the eye or they need corrective lenses – but don't have any, so visuals need to be larger.*

- **How important do you think the use of color would be?**

Most respondents said that the use of color would most likely be important to conveying the message accurately and attracting the attention of the target audience. Comments regarding the use of color in pictograms included:

- *The use of color would likely be important for those refugees originating in parts of the world where the use of bright colors is a common and effective method of communicating importance as well as attractiveness.*
- *The use of color is very important.*
- *Color may add meaning to the sign.*
- *We have found in most cases that low-level literacy (not scientifically researched) adults respond more to bright colors. Few words and colors have the most impact.*

- **If advance public education is required for people to understand pictures once they arrive at a POD, what strategies could you suggest for public education in advance?**

Respondents suggested partnering with service providers and community based organizations as well as distributing information in gathering places where the target audience frequents and in the appropriate languages. Respondents recommended several education and outreach strategies:

- *Continue partnerships with social service agencies. Arrange for such agencies to provide education in addition to their core services.*
- *Posters displayed in major points of congregation may also be effective. Such posters could appear in several languages. Social service agencies may help you to identify points of congregation.*
- *Maybe use similar images that come in the picture dictionaries that are used at the ESL classes.*
- *A flier of the signs with captions will be good.*
- *Community meetings, public service announcements, and information sessions at libraries, church, childcare centers, etc., that explain the plan.*
- *Place the information in places that the population frequents.*
- *Maybe use community educators although this does not have emergency preparedness programs beyond what is available from the public health department*
- *This could mean TV ads, newspaper ads, flyers, etc. I would suggest having items printed in various languages.*

- **Is there any advice you could give in the early phases of this planning that would help public professionals meet the needs of the people you serve?**

Respondents offered advice about the ways in which public health professionals could meet the needs of special populations groups, particularly in the early planning phases of using picture-based communication at Points of Dispensing. Representative comments included:

- *Continue to open communication channels between public professionals and community brokers. Brokers are able and willing to help.*
- *Pull together a focus group of adults and children (consider communities, schools and work environments). The goal is to see what pictures or words are effective and convey the correct messages.*
- *Use pictures that are diverse in language and ethnicity.*
- *Provide videotapes (staged/role play) of people responding in emergencies.*
- *Offer trainings and information sessions in churches, libraries, community centers, and apartment complexes.*
- *Pull together a group of professionals (educators, bus drivers, health care professionals, clergy, store owners, etc.) who work with a diverse populations to discuss what they know about their environment and the people they serve.*
- *Be sure to use accurate native terms. For example, the “flu” can translate differently in different languages.*
- *My advice is basically to 1) use a combination of visuals, spoken words, and demonstration; 2) remember that some individuals have a difficult time with two-dimensional representation; 3) make sure visuals are large for folks with sight problems.*

Focus Group Discussions

Focus group discussions were conducted with representatives from LEP and deaf and hard-of-hearing populations as well as service providers and advocates for these population groups. The focus group discussions were divided into three parts: General Emergency Preparedness; Key Messages/Terminology at an SNS Dispensing Site; and Testing Different Symbols, Pictures, and Pictograms.

The first portion of the discussion was devoted to general emergency preparedness topics to determine the level of personal experience in emergencies; the processes participants use to receive information in an emergency; communication barriers to receiving emergency information; and current emergency preparedness levels among the participants.

The purpose of the second portion of the focus group discussions was to encourage participants to discuss basic messages they would need to understand at an SNS dispensing site and to describe visual representations that would demonstrate a particular message. For example, if a key message at a dispensing site is “please wait” or “wait in line,” what picture or visual exemplifies that action? This portion of the focus group was sometimes shortened or excluded due to either time constraints or language limitations that made it difficult for participants to envision how certain messages could be communicated visually through symbols or pictures.

The third portion of the focus group discussions tested different symbols, illustrations, and photos to determine the accuracy of the message depicted and to identify any style preferences and why those preferences existed. Participants reviewed 18 different pictograms that included representational, arbitrary, and abstract graphic symbols that had some level of relevance to the terminology identified by SNS staff. The symbols that were tested included descriptive, prescriptive, and proscriptive messages to determine the types of messages that were more easily understood and recognized by participants.

The same evaluation process was used in all focus groups. Participants were asked to view each pictogram individually and to evaluate the meaning and the style of each picture. All focus group participants evaluated the same pictograms and in the same order of presentation. After all of the symbols were evaluated, participants selected five favorite symbols based on clarity of the message conveyed and discussed why they preferred those symbols to others.

Part I – General Emergency Preparedness:

The objective of the opening portion of the focus group discussions was to encourage respondents to share personal experiences in emergency or crisis situations and to discuss general issues of emergency preparedness, communication and response.

The personal experience in emergencies among most respondents was limited to specific situations, such as natural disasters, ice storms, or fires; however, a few respondents described experiences living through wars (Bosnia and Vietnam). Those with war experience were the only respondents indicating they had prepared emergency kits at home in case of crises or disaster. One mentioned food and battery-powered items in storage, while another talked of birth certificates, personal records, and a money reserve that were kept in case of emergency. While these respondents stressed the importance of being prepared for emergency situations, one alluded to the “arrogance” of United States citizens who seldom, if ever, acknowledge the possibility of a disaster and therefore do not prepare. The perception was that although the United States has more resources and opportunities, such as canned goods, gas masks, and other emergency preparedness items that are readily available for purchase, citizens typically do not prepare themselves for emergency situations.

Other respondents cited economic or financial barriers to emergency preparedness that would prevent their family, friends, and peers from preparing for a disaster beforehand. Participants noted that they would often be more concerned with personal belongings, such as their televisions and clothes, than

with their personal safety, and consequently would not act on emergency information.

Many respondents said they relied on social networks for receiving assistance and information in emergencies. Others relied on communication devices, such as pagers or alternative media sources, for emergency assistance and information. One respondent tried to use an emergency radio that connected to a vibrating mechanism to communicate emergency weather information; however, the radio provided inaccurate weather alerts and irrelevant weather information.

Participants cited the following resources they would access for help:

- Calling 9-1-1.
- Watching television.
- Writing notes to hearing people they are with or seek out.
- Hearing family members or people.
- Fax machines.
- Pagers.
- Family members, neighbors and friends who speak English.
- Available news sources in native language.
- In rural areas, clubs or social gatherings are very effective mechanisms for information sharing in the deaf and hard-of-hearing community.

Some respondents indicated that even in emergency situations, they would not seek assistance. One participant described being fearful of hearing sirens outside, but had no intention of acting on that fear. In another instance, a participant said that even in the event of a flood, family members would “huddle up and die together” and “grab the backs of chairs and float away.”

Respondents cited communication and language barriers that prevent them from receiving emergency information and responding appropriately. For example, during ice storms or other incidents that caused power outages, respondents have been unable to communicate with the electric company and therefore had no information regarding when the power would be restored. One participant indicated that deaf or hard-of-hearing people were always the last to receive information and often had to search for information themselves rather than receiving communication directly. In addition, financial barriers can prevent deaf or hard-of-hearing individuals from having the capability to communicate via pagers or other electronic communication devices.

Representative comments regarding communication barriers included:

Telephone conversations can be challenging. Face-to-face communication is preferred because you can see hand gestures and movements when people speak.

There are challenges to working with people with special needs, particularly non-English speaking groups. People come to the United States with limited language skills. Some cannot read or write in their own native language, much less in English. Some children, however, come to this country very young, and because of that, know English better than their native language.

Age and the area of a country they are coming from are important factors in the way in which people receive and comprehend information. Even as an interpreter, it is often difficult to communicate the proper message.

There are sometimes language barriers as a result of gaps between first and second generations, which cause concern about people getting the proper help or information during an emergency.

There is a need for more information in emergencies. Often emergency information is confusing because of lack of experience with a particular type of emergency, like a tornado.

In rural areas, many pagers don't work, so face-to-face assistance is almost always required.

The consensus among the deaf and hard-of-hearing community is that skills, particularly signing or lip reading, diminish during emergencies due to high stress; therefore, the need for assistance and advance preparation in emergencies is of even greater importance than for the mainstream population.

The Spanish stations on television never have weather updates, so it is difficult to know about severe weather issues. Immediate local news is also hard to find in some languages.

Part II – Key Messages/Terminology at an SNS Dispensing Site:

The purpose of this portion of the focus group discussions was to encourage participants to discuss basic messages people would need to understand at an SNS dispensing site and to envision visual representations or symbols that could demonstrate these messages. For example, if a message were “medicine here,” what picture or symbol would communicate that message?

Participants were asked to discuss what symbols or pictures came to mind that would depict messages or terminology identified by the DSNS staff as potential messages required for dispensing sites. The following indicate the messages discussed with participants and corresponding responses about potential pictures that could depict the message.

“Medicine Here”

Respondents suggested that a hospital road sign (blue sign with large “H”) or a pharmacy-related symbol would communicate this message, although some said that immigrants coming to the U.S. for the first time would not understand the meaning of the hospital road sign. Other participants envisioned a picture of a

nurse or medical professional in uniform or a picture of multi-colored pills. Color would play an important role in the way the meaning of this message is conveyed. In particular, the use of the color red can mean different things to different cultures.

“Please Wait”

Respondents suggested using a stop sign to communicate this message. Although immigrant populations are limited by their English-speaking abilities, many immigrants work as truck drivers and therefore understand road signs. Other participants said that they had only seen signs with the words “please wait” to communicate this message. One person suggested creating a sign with a few people in a roped-off area.

“Interpreter or Interpretation needed”

Respondents said that “I Speak” cards are helpful for communicating when translation is needed. Another suggestion included creating a poster or some type of visual that listed a variety of spoken languages and enabled people to point to the language they speak or a sign that says “I Need an Interpreter” in several languages.

“Contagious/Not Contagious”

The overall sentiment was that people would not be educated enough about diseases to know whether they were contagious. Respondents preferred the word “sick” over contagious for ease of comprehension and indicated that most people, particularly non-English speaking groups, are unlikely to understand the word “contagious.”

“Put On A Mask”

Recommendations included a step-by-step picture or illustration of how to put on a mask. Participants emphasized the importance of using more than one picture to demonstrate the process or action of putting on a mask. They said to never assume that people would know what to do; rather show them how to do it.

“Forms or Fill out a Form”

The consensus across several focus groups was that first it needs to be determined if a person needs an interpreter and second what language a person speaks. Respondents indicated that it is also important to consider people who are deaf or hard-of-hearing who need sign language interpretation that may be different than American Sign Language.

Respondents suggested that training would be necessary for non-English speaking people to understand pictures or symbols that communicate medical or health messages. They suggested the use of videotapes with instructions (that interpreters could assist with) to accompany signs or symbols. Participants believed the most effective and easily understood symbols would be those accompanied by words.

Part III – Testing Different Symbols, Pictures and Pictograms:

Respondents evaluated 18 different symbols, illustrations, and photos to determine the accuracy of the message depicted and to identify any style preferences and why those preferences existed. Participants were asked to identify five favorite pictograms for perceived clarity of message and/or design features.

The same evaluation process was used in all focus groups. Participants evaluated the same pictograms and in the same order of presentation.

Accuracy

- Pictograms 10 and 18 (see Appendix E) tested as some of the most accurate; nearly every respondent was able to accurately articulate the meaning of both of these pictograms.
- Respondents associated pictogram number 1 with a medical-related meaning. Several indicated that the use of color on the cross symbol would impact the meaning conveyed. For example, if the cross symbol were red, they would immediately associate this pictogram with the Red Cross or first aid. In addition, the pictograms that included proscriptive messages, such as “No Smoking,” conveyed accurate messages to participants. Most respondents indicated that the prohibit symbol is universal and easily identifiable.
- Most respondents demonstrated an understanding of pictogram number 2 by associating it with information or as an indicator of a location where information could be received. Some indicated that the picture was too busy and that the circle around the question mark was confusing to the overall meaning; however, even those participants who articulated displeasure with the design of the pictogram were able to comprehend its meaning.

Style Preferences

- In terms of style and design features, the majority of respondents preferred dark symbols or pictograms on white negative space.
- Much discussion centered on the use of color in pictograms across multiple focus group discussions. Respondents cautioned against the use of color in certain pictograms because color can convey different meanings to different cultures. For example, one participant said that if pictogram #1 remained in black and white, it would signify death or a morgue.
- Several respondents recommended the use of two colors in symbols that represented medicine or pill capsules.
- The majority of respondents were in agreement that the meaning conveyed in most of the pictograms was not impaired by the use of black and white symbols.
- Some discussion centered around the impact of color on blind people. Participants cautioned against the use of dark contrasting colors, such as red on black or vice versa. In addition, incorporating shades of gray into the overall color scheme of symbols, such as numbers 11, 12, 13 and 14 will prevent the blind from discerning the symbol. Pictograms, such as numbers 4 and 18, were identified as having good contrasting colors,

particularly for the blind. Respondents recommended the use of thicker lines for borders and illustrations.

- The majority of respondents agreed that incorporating a limited number of simple words with each symbol/picture would greatly enhance the clarity and meaning of the message conveyed. They cautioned against the use of multi-syllable words that LEP populations would not understand.
- Most respondents preferred illustrations to photographs, indicating that if a person portrayed in a photograph did not resemble themselves, particularly in regard to nationality, then the meaning of the photograph would be less effective. Respondents also said that the look of a person in a photograph could be distracting. While participants were ambivalent to the use of caricatures or cartoon-like symbols (such as number 13), there were some instances where illustrations were preferred.
- Respondents who were deaf or hard of hearing pointed out that pictograms that place a great deal of emphasis on telephone use, such as numbers 6 and 7, caused them to think “this message is just for hearing people.” They indicated that 711 is the Text Telephone (TTY) emergency telephone number they utilize, and therefore, picture number 7 would have little meaning to them. Other respondents said that telephones are not helpful to deaf or even to some non-English speaking people, and therefore, they would simply disregard the message.
- Respondents had mixed opinions about incorporating an ASL sign within all pictograms to meet the needs of people in deaf or hard-of-hearing communities.
- Including a person who was deaf or hard of hearing on the design team for any pictograms to ultimately be developed by SNS was a widely agreed upon suggestion. Working with the National Association of the Deaf for symbol development and design was also suggested.
- Participants recommended implementing a public education and training campaign upon the CDC’s development of a standardized symbol/picture system to ensure the symbols are universally understood.

Favorite Pictograms

- Overall, respondents were consistent in the pictograms they chose for accurate message depiction and style and design preference. The most commonly chosen pictograms included numbers 1, 2, 10, 11, 12, 13, and 18.
- Pictogram numbers 10 and 18 elicited the strongest positive reaction from most participants in terms of comprehension of the message conveyed and overall design features.
- The pictograms that conveyed proscriptive messages, such as “No Littering” and “No Smoking” were well received by most participants.

Appendices

APPENDIX A RESOURCES

- Bolek, Jim and Jamie Cowgill. *Symbol Usage in Health Care Settings for People with Limited English Proficiency*. April 2003.
- Centers for Disease Control and Prevention. *Receiving, Distributing, and Dispensing Strategic National Stockpile Assets: A Guide for Preparedness*. Version 10 – Draft. June 2005.
- Davies, S., H.M. Hains and B.J. Norris. *The Role of Pictograms in the Conveying of Consumer Safety Information*. Originally printed December 1997. Reprinted March 2000.
- Dymon, Ute J. *An Analysis of Emergency Map Symbolology*. 2003.
- Federal Geographic Data Committee. 14 September 2005.
<www.fgdc.gov/HSWG/ref_pages/SymbologyBackground_ref.htm>
- Get 2 Testing. 8 July 2005. <www.get2testing.com/Contacts_E.htm>
- National Cancer Institute. 27 February 2003.
<www.cancer.gov/aboutnci/oc/clear-and-simple>
- “A Picture of Health.” *The Mission*. February 2003.
<www.uthscsa.edu/mission/article.asp?id=112>
- Wood, Rick. “The Dos and Don’ts of Passenger Service Guides.” *Metro Magazine*. May 2004.

APPENDIX B
SUBJECT MATTER EXPERTS AND AFFILIATIONS

Subject Matter Expert Consultants

Affiliation

-Marty Gustafson, program manager

Comprehensive Adult Student
Assessment System (CASAS)

-Ana Marie Jones, executive director

Collaborating Agencies
Responding to Disaster (CARD)

APPENDIX C

INTERVIEW QUESTIONS AND INTERVIEWEES

Professionals Interviewed

-Nancy Hanna
medical interpreter

-Andrew Holtman
refugee case manager

-Suzanne McCurdy
ESL training coordinator

-Claudia Peralta-Mudd
international program specialist

-Kathy Stovall
family literacy specialist

-Dr. Guangming Zou
assistant professor of TESOL

Affiliation

Washington County, Ky., Health
Department/Washington County
Public Library

Jewish Vocational Service of
Kansas City, Mo.

Minnesota Literacy Council

Office for International Affairs
Louisville, Ky.

National Center for Family
Literacy

Institute for International Studies
Department of English and
Philosophy
Murray State University

Interview Questions

- What is your knowledge of previous experiences the population you serve may have already had with picture-based communication? Do you know if those experiences have been more positive or negative?
- Please share your opinion about communicating critical messages with the use of pictures or illustrations alone, versus those accompanied by limited words.
- Based on the communication needs of the population group you work with, are there types of pictures that you believe could more effective? How important do you think the use of color would be? (e.g., photographs, basic diagrams or illustrations)
- If advance public education is required for people to understand pictures once they arrive at a POD, what strategies could you suggest for public education in advance?
- Is there any advice you could give in the early phases of this planning that would help public professionals meet the needs of the people you serve?

APPENDIX D
FOCUS GROUP DISCUSSION GUIDE AND PARTICIPANT PROFILES

Focus Group	Participant Profile	Location
Focus Group #1	Limited English Proficiency – participant profiles included individuals from Vietnam and Bosnia	Louisville, Ky.
Focus Group #2	Limited English Proficiency – participant profiles included low literacy learners as well as individuals from Pakistan, China and Japan	Louisville, Ky.
Focus Group #3	Deaf/Hard-of-Hearing Individuals	Frankfort, Ky.
Focus Group #4	Limited English Proficiency – participant profiles included individuals from Libya and China	Kansas City, Mo.
Focus Group #5	Limited English Proficiency – participant profiles included individuals from Mexico	Kansas City, Mo.
Focus Group #6	Deaf/Hard-of-Hearing/Blind Individuals	Shawnee, Kan.

APPENDIX E
IMAGES TESTED IN FOCUS GROUP DISCUSSIONS



