

Prevention from the Harm of Health Illiteracy in Ohio

by The Health Foundation of Greater Cincinnati

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Foreword

In 1999, The Health Foundation of Greater Cincinnati entered a partnership with The Anthem Foundation of Ohio to generate white paper reports to assess regional health care needs in four areas of concern: 1) Prevention from the Harm of Health Illiteracy, 2) Prevention of Family Violence, 3) Prevention of Lead Exposure, and 4) Preventive Oral Health Care.

This report was written with the latest available data for a 36-county region, shown below.



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About the Foundations

The Health Foundation of Greater Cincinnati is a 501(c)(4) social welfare organization that awards grants to non-profit and governmental organizations for selected health programs and activities in Cincinnati and 20 surrounding counties including:

- Adams, Brown, Butler, Clermont, Clinton, Hamilton, Highland, and Warren Counties in Ohio;
- Boone, Bracken, Campbell, Gallatin, Grant, Kenton, and Pendleton Counties in Kentucky; and
- Dearborn, Franklin, Ohio, Ripley, and Switzerland Counties in Indiana.

The Health Foundation concentrates its grantmaking in four focus areas: Strengthening Primary Care Providers to the Poor, School-Based Child Health Interventions, Severe Mental Illness, and Substance Abuse. For more information about the Health Foundation, visit our web site at <http://www.healthfoundation.org> or call us at (513) 241-1400.

The Anthem Foundation of Ohio was established in 1999 to improve the health of low-income and medically underserved Ohioans by investing in preventive health projects and initiatives. The Anthem Foundation awards grants to non-profit and governmental organizations in 36 Ohio counties, including: Adams, Allen, Auglaize, Belmont, Brown, Butler, Carroll, Clark, Clermont, Clinton, Columbiana, Darke, Greene, Hamilton, Hancock, Hardin, Harrison, Highland, Holmes, Jefferson, Mahoning, Mercer, Miami, Monroe, Montgomery, Noble, Preble, Putnam, Scioto, Shelby, Stark, Trumbull, Tuscarawas, Van Wert, Warren, and Washington Counties.

The Anthem Foundation focuses its grantmaking in two areas: preventive oral health care and family violence prevention. The Anthem Foundation is a supporting organization of The Greater Cincinnati Foundation, a charitable organization that builds and preserves endowment funds, identifies opportunities to enhance the quality of community life, and awards grants in an eight-county region in Ohio, Kentucky, and Indiana.

For more information about The Anthem Foundation, please call (513) 241-2880, ext. 128.

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Prevention from the Harm of Health Illiteracy in Ohio

Tom had been told by his physician that he needed to lower his fat intake due to early signs of heart disease, but he didn't understand how to read food labels to know which foods were low fat or how to determine which menu items were lower in fat at restaurants. Tom also did not comprehend the importance of getting to the emergency room immediately upon signs of chest pain. As a result, Tom had a heart attack at age 42 and died before he got to the hospital for treatment.

Mary Ann is 45 and breast cancer runs in her family. She had no idea that women over 40 need to have annual mammograms to detect breast cancer at its earliest stages when it is most treatable. She noticed a lump in her breast one day when showering and immediately went to the doctor. Tests revealed that the cancer had already spread to the lymphatic system. Mary Ann is currently undergoing chemotherapy and has a much lower chance of survival than some of her doctor's other patients, who had detected their cancer through mammograms prior to metastasis.

Suzie is 4 years old and has an ear infection. Her mother took her to the pediatrician who prescribed antibiotics. Not understanding what "take orally" meant, Suzie's mother poured the antibiotic in her ear, assuming that was where the medication was needed since it was an ear infection. Suzie's ear infection did not get better and she had additional complications due to her mother's error. She is now back in her pediatrician's office seeking additional treatment.

Introduction

The above stories and countless others describe the impact of low health literacy on health status (Davis, Meldrum, Tippy, Weiss, & Williams, 1996). As the examples above show, a lack of health literacy is a barrier at each level of prevention: primary, secondary, and tertiary. This problem can be significantly reduced with effective health education materials, campaigns, and programs.

Definitions

A key characteristic of literacy is that it is not "all or nothing." There is a wide spectrum of literacy abilities (Davis, et al., 1996). One component of literacy is understanding or comprehension. Simply being able to read the words in a sentence does not ensure that a person can comprehend the meaning of that sentence. Literacy problems also extend to verbal communications. A low-literate or illiterate person may not be able to

comprehend verbal instructions any better than written ones (Doak, Doak, & Root, 1996).

To truly comprehend health literacy, one must understand the hierarchy of literacy definitions. This paper addresses three definitions: literacy, functional literacy, and health literacy. Literacy is broadly defined as using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential. Literacy is a core skill that is required for functional literacy. Health literacy is a form of functional literacy.

Literacy is composed of three functional-ability areas. The first is prose literacy, the ability to extract information from editorials, news stories, poems, and fiction. The second is document literacy, which involves understanding job applications, payroll forms, transportation schedules, maps, tables, and graphs. The third

area, quantitative literacy, involves the use of numbers to balance a checkbook, figure a tip, complete a catalog order form, and perform various other tasks (Kirsch, Jungeblut, Jenkins, & Kolstead, 1993).

Functional literacy is a specific form of literacy that varies by context and setting. It refers to one's ability to use reading, writing, and computational skills in specific, everyday situations. (Kirsch, et al., 1993). When functional literacy involves health information and the healthcare system, it is called health literacy or functional health literacy.

Understanding the relationship between literacy and health literacy is crucial to grasping the true magnitude of the problem in society. Basic literacy is at the core of health literacy. If people do not have basic reading, writing, and speaking skills, they cannot apply these skills to utilize health information or to interact with the healthcare system. Being able to read, write, speak, and understand English in a general context, however, does not mean that a person can apply those skills to health information. Health information is generally more complex to read and understand, and accordingly an individual's health literacy level is often even weaker than his/her general literacy level (Parker, Williams, et al., 1999).

Health literacy encompasses many skills necessary to utilize the healthcare system. For example, it includes the ability to:

- read and understand medication instructions;
- read, understand, and be able to complete insurance forms;
- understand written or verbal instructions for behavioral change;

- be aware of the need for preventive health services like mammograms, prostate cancer screenings, etc.;
- read signs in hospitals and doctor's offices to know where to go and what to do; and
- have a host of other skills required to navigate the healthcare system and to optimize healthcare delivery (Parker, et al., 1999).

According to the National Health Education Standards developed by the Joint Committee on National Health Education Standards (1997)—which included representatives from the Association for the Advancement of Health Education, the American School Health Association, the American Public Health Association and the American Cancer Society—a health literate person is one who is a critical thinker and problem solver; a responsible, productive citizen; a self-directed learner; and an effective communicator. These identified skills are much more complex than those required for general literacy.

Statistics

The 1992 National Adult Literacy Survey (NALS), the most recent analysis of English literacy within the United States, found that 40–44 million Americans over the age of 16 (approximately 22% of the adult population) are functionally illiterate. Another 50 million have marginal literacy skills. This equates to roughly half the adult population in the United States (Kirsch, et al., 1993). The results of this survey are broken down by region of the country rather than by state. This breakdown demonstrates no

significant differences in health literacy between the midwest, the west, the south, and the east. At the time of this writing, there are no available data on literacy levels within each of Ohio's counties. However, based on the fact that literacy levels are fairly consistent nationwide, there is no reason to believe that significant differences would exist in Ohio counties.

To date, there have been no national surveys on health literacy. The largest study of health literacy was conducted at two public hospitals and included 2,659 subjects. The subjects were categorized into three groups by city and native language: Atlanta, Georgia—English; Los Angeles, California—English; and Los Angeles, California—Spanish. The study found that 41.6% were unable to comprehend directions for taking medication on an empty stomach, 26% were unable to understand information on when their next appointment was scheduled, 49.5% did not know how to determine financial eligibility for aid, 59.9% could not understand a standard informed consent document, and 36.1% could not understand the rights and responsibilities section of the Medicaid application. Overall, this study found that

61.7% of the Spanish speaking subjects from Los Angeles, 47.4% of the English speaking patients from Atlanta, and 22.0% of the English speaking patients from Los Angeles had inadequate or marginal functional health literacy (Williams, Parker, Baker, Parikh, Pitkin, Coates, & Nurss, 1995). These results are consistent with the findings on literacy from the National Adult Literacy Survey (Kirsch, et al., 1993).

Identifying Illiterate or Low-Literate People

There are two general methods of identifying people with health literacy problems. The first is to use specific tools that measure health literacy. Two inexpensive and quick tests are the Rapid Estimate of Adult Literacy in Medicine (REALM) and the Medical Terminology Achievement Reading Test (MART). The second method simply involves observing people to find behaviors which might indicate they have compromised health literacy. This second method is much less scientific but often more useful in clinical settings, due to the lack of time to otherwise assess patients.

Consequences of the Problem

Low literacy levels impact health status in a variety of ways, such as poorer health, higher health care costs, and various medicolegal issues. Many of these are difficult to measure because they are hard to identify. In addition, people with low literacy are often unwilling to discuss it or admit they have it.

Poorer Health

Accessing the healthcare system is problematic for low-literacy populations. Some may not understand where to go to seek help or how to determine when their symptoms are severe enough to seek help. They may also not be aware of programs available to help them offset healthcare service costs. One study in Georgia found that 74% of denials for Aid to Families

with Dependent Children were due to procedural reasons, meaning applicants failed to return documents or to keep interview appointments. When those applicants were contacted and interviewed, the second most common reason they gave for failing to return necessary documents was failure to understand them (Shuptrine, 1993).

Low-literacy populations also lack basic health knowledge about disease prevention, detection, treatment, and management (Bennett, Ferreira, et al., 1998; Davis, Arnold, Berkel, et al., 1996; Weiss, Blanchard, et al., 1994). The lack of knowledge regarding disease prevention may leave low-literate people at greater risk for disease. Additionally, ignorance of early disease detection often leads to discovery of diseases and illnesses at later stages, which may result in longer recovery times and more invasive procedures to treat or manage the disease.

Low-literate persons are also less likely to be able to understand and follow medical instructions provided after emergency room visits, surgery, or diagnosis with chronic disease or illness (Gazmararian, et al., 1999; Parikh, et al., 1996; Spandorfer, Karras, Hughes, & Caputo, 1995; Weiss, Blanchard, et al., 1994). These instructions may include prescription or over-the-counter medication instructions, safety precautions, or instructions for exercise and activity. Improper self-care following medical procedures often leads to longer recovery time and medical complications, which require additional medical care. Improper use of medications can lead to ineffective treatment of the disease or illness or, at worst, may result in further harm to the individual.

Negative health and safety behaviors have been shown to be linked to lower literacy levels (Michielutte, Alciati, & Arculli, 1999). Poorer dietary practices, lack of exercise, higher rates of smoking, increased consumption of coffee, and lack of smoke detectors and fire extinguishers in the home are all associated with lower literacy levels and increased risk for chronic diseases or injury.

Literacy levels can also affect the results of clinical tests. One study has demonstrated that reading skills have a strong negative correlation with the scores patients receive on the Mini-Mental State Examination (MMSE), a test of dementia (Weiss, Reed, Kligman, & Abyad, 1995). Similarly, scores on self-administered questionnaires regarding health status and general health have been shown to be influenced by literacy levels (Weiss & Coyne, 1997). Interpreting the results of such tests without taking into account the patient's literacy level may lead to incorrect diagnosis or treatment for the patient.

Baker, Parker, Williams, Clark, and Nurss (1997) examined the relationship between self-reported health status and literacy levels and found that those with inadequate functional health literacy were 2.23 times as likely to report their health as poor compared to those with adequate health literacy. This relationship remained even when results were adjusted for other demographic variables such as age, gender, race, and socioeconomic status (Adjusted OR=2.19). The link between literacy rate and health status is so strong that literacy rates are included in several measures of international health status, including the Physical Quality of

Life Index, the Health Status Scale 1, and the Health Status Scale 2 (Larson, 1991).

Higher Healthcare Costs

Results of several studies indicate that lower levels of health literacy and the associated poorer health status would equate with higher healthcare costs. Parker, Baker, Williams, and Clark (1998) found that 32% of those classified with inadequate literacy levels were hospitalized over a two-year period, while only 15% of those with adequate literacy and 16% of those with marginal literacy were hospitalized. The percentage of subjects with two or more hospitalizations was also higher among those with inadequate literacy levels compared to those with either adequate or marginal literacy: 14%, 5%, and 6%, respectively. When other demographic factors were taken into account, literacy was still found to be a strong predictor of hospitalization. There was a 52% increase in the risk of hospitalization in patients with inadequate literacy compared with patients with adequate literacy.

Additional studies support that lower literacy patients have more hospitalizations per year, healthcare costs of up to six times higher than the average, and more outpatient visits (Baker, et al., 1997; Weiss, Coyne, Michielutte, et al., 1998; Davis, Berkel, Arnold, et al., 1998). Only one study has refuted these findings: Weiss and colleagues (1994) reported that their sample of 402 Medicaid enrollees demonstrated no association between healthcare costs and literacy level.

These results combined with the results from the NALS can be used to estimate the cost of low-level literacy to society: \$8–15 billion per

year in excess hospital costs attributable to poor literacy (Marwick, 1997).

Medicolegal Issues

Many of the literacy problems that lead to poorer health have medicolegal ramifications as well. It is the healthcare provider's responsibility to ensure that patients comprehend medical instructions, whether written or verbal. Although the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requires hospitals to provide patients with understandable health instructions (Weiss, et al., 1997), and while most hospitals do document providing these instructions, there are few mechanisms in place to ensure that the patient truly understands the materials received (Miles & Davis, 1995). Readability of patient materials extends far beyond prescription bottles and health information brochures. Informed consent forms, living wills, and power-of-attorney forms are all written materials that are crucial for patients to understand. However, most of these documents are written at readability levels beyond the high-school level (Murphy, Davis, Jackson, Decker, & Long, 1993). Failure of patients to comprehend these documents is not only an ethical issue, but a legal one as well. Hospitals and medical practitioners place themselves at risk for liability by failing to ensure that their patients are providing informed consent.

Verbal communication between physicians and their patients has also been shown to be problematic. In a study examining 88 audiotapes of primary care office visits involving 44 physicians, researchers rated discussions

between doctors and patients based on the six criteria for informed decision making:

- 1) description of the nature of the decision,
- 2) discussion of alternatives,
- 3) discussion of risks and benefits,
- 4) discussion of related uncertainties,
- 5) assessment of the patient's understanding, and
- 6) elicitation of the patient's preference.

The mean number of criteria met per audiotaped session was 1.23. The most frequent criterion discussed was the nature of the decision. Risks and benefits were only discussed in 9% of the sessions, and, most important to the discussion of health literacy, assessment of patient understanding occurred in only 2% of

those office visits. The authors concluded that these discussions did not fulfill the criteria required for informed decision making (Braddock, Fihn, Levinson, Jonsen, & Pearlman, 1997). Again, this is not only an ethical problem in healthcare, but a legal issue as well.

It is also crucial to understand the influence of literacy on medical screening questionnaires often used to aid in diagnosis and treatment decisions. Scores on many of these documents are negatively influenced by lower literacy levels. Patient care may be compromised due to this problem, and hospitals and medical practitioners may be placing themselves at risk for liability through failure to recognize literacy level as an important issue.

Populations Most Affected by this Problem

Health illiteracy can affect the entire community. Many people who are considered literate may have difficulty understanding medical terms and instructions. Redesigned health education materials and medical instructions can benefit all people, regardless of their literacy level. However, health illiteracy most adversely affects people with the lowest general literacy levels, who are very adept at masking their illiteracy and are less inclined to ask clarifying questions when they do not understand something.

No studies have examined the demographic characteristics of health literacy. The National Adult Literacy Survey (NALS) is the only descriptive measure available to assess group differences on literacy in general. The NALS found that inadequate and marginal literacy affects every ethnic and age group, both genders,

and all educational levels and employment categories (Kirsch, et al., 1993). A person with a literacy problem cannot be visually identified, nor is a person's educational level directly related to his or her reading level (Davis, Mayreux, et al., 1994; Doak, et al., 1993; Kirsch, et al., 1993; Jackson, Davis, et al., 1991).

Although demographic characteristics of health literacy are not known, there are some demographic trends with general literacy. Functionally illiterate adults are more likely to live in poverty and to have fewer years of education than the average American. Older adults and minority groups are more likely to be living in poverty than younger Americans and Caucasians. Given this, it may not be surprising that approximately 75% of adults over age 65 fall within the lowest two literacy ability categories

and that minority groups have higher rates of inadequate and marginal literacy than Caucasians. Users of Medicare and Medicaid are twice as likely to have inadequate or marginal literacy compared to the general population. Age and minority status trends once again appear: the primary users of Medicare and Medicaid are older adults and minorities because of their age or poverty status (Kirsch, et al., 1993).

Although there are no specific literacy or health literacy demographics for Ohio counties,

Appendix A compares the demographic characteristics associated with lower literacy levels in the 36-county region under review. As one can see from the appendix, the counties are fairly similar in demographic characteristics related to poor literacy, indicating that health literacy may be a problem in all these counties, with a few counties appearing to be at a slightly higher risk for poor literacy.

Work Underway in the Field

A variety of strategies have been used to attempt to deliver health information to individuals with low health literacy. Some techniques have been used alone, and many others have been used in combination. These techniques can additionally be used for any health program to help insure that materials on any subject are readable by low-literate people.

Redesigning Written Materials at Lower Reading Levels

Many health materials designed for low-literacy populations exist, but they can be hard to access. In addition, many providers have materials that were created specially for their particular practice and therefore may not be used by other providers. As a result, people who do not have a primary care physician and visit several providers are faced with a number of forms and materials asking for or giving the same information in a variety of ways or formats.

Redesigning or rewriting patient education materials and healthcare forms, such as informed consent and discharge forms, at lower reading

levels has been one of the most widely documented techniques and seems like the simplest approach to a complex problem. Studies have shown that materials with lower reading levels do reach a larger number of subjects and are better received and better understood (Davis, Bocchini, et al., 1996; Estey, Musseau, & Keehn, 1991; Jolly, Scott, & Sanford, 1995; Overland, Hoskins, McGill, & Yue, 1993). Unfortunately, the effectiveness of this technique is limited. Its most basic problem is that, by lowering the reading level, one only makes the material accessible to people who can read above that level. There will still be members of the target population who will not be able to read the material at all and some who can read the words but not comprehend their meaning. Most researchers recommend reading levels at the third, fourth, or fifth grade levels (Davis, et al., 1996; Estey, et al., 1991).

The low-literacy population is a specific target group, and materials need to be developed specifically for them as an individual group in order to be as effective as possible. But simply

rewriting materials at a lower level does not address all of the issues. Materials should be designed with input from members of the target audience and pre-tested to ensure relevance and effectiveness.

Designing Written Patient Education Materials with an Emphasis on Illustrations

Illustration-laden print materials are a little more effective than pure text, but there is still the problem of reading level. Even materials with low reading levels are inaccessible to some members of the target population. Most developers of new low-literacy patient education materials include pictures and graphics to complement the message of the text. These materials are more effective than text messages alone but do not eliminate the problem of low comprehension. Members of the target population should give input during the materials development process, and materials should be pre-tested with target audience members to ensure appropriateness and effectiveness.

When redesigning written patient-education materials or developing new ones, one should consider several factors in addition to readability levels (Doak, et al, 1996):

- the print size and type style—make sure that the print is large enough and clear enough to be read easily by even those with poorer vision;
- color contrast between the ink and the paper—forget artistic appeal and focus on ease of reading;
- the self-efficacy factor—ensure that the written material does not appear overwhelming to the reader or does not

discourage the reader before he or she even begins reading;

- the concept density—do not squeeze many concepts and facts into each paragraph; even if the readability score is low, the reader may be overwhelmed; and
- unfamiliar context—be aware of the context in which familiar words are being used; even if a word is familiar to a reader in a different context, he or she may not be able to grasp the meaning in a medical context.

Because most research has shown that low-literacy written materials alone are not enough to improve comprehension in low-literate patients, writers are experimenting with a variety of techniques using visual aids in addition to verbal communication strategies and have shown promising results thus far.

Pictographs

The Pictograph Research Project is a program of the Johns Hopkins Oncology Center.

Pictographs are simply pictures that represent ideas normally communicated with words. The pictographs are printed on cards which patients or their caregivers receive during a meeting with a healthcare provider. The instructions are presented orally, while the patient or his or her caregiver views the pictographs. The pictographs can then be taken home to remind the patient or caregiver of the instructions. Several studies support the effectiveness of pictographs (Eustace, Johnson, & Gault, 1982; Houts, Bachrach, et al., 1998). Houts and colleagues (1998) also demonstrated that pictographs in combination

with oral instructions produce much greater recall scores than verbal instructions alone.

Photonovels

Photonovels are a popular form of literature in many parts of the Americas. A photonovel involves the use of photographs with captions to tell a story. The presentation of information in this manner is more interesting to the reader because the drama of the pictures draws him or her in. It is also effective for low-literacy populations because of the limited use of written text. Photonovels ensure that messages are culturally appropriate by including photographs of people from the target population's culture. A photonovel can be very simple or very sophisticated, depending on the developer's budget and needs. Photographs can be black and white so that inexpensive copies can be made on a photocopy machine, or a color booklet can be developed and professionally reproduced (Rudd & Comings, 1994).

Audio-Visual Education Materials

Audio visual materials, especially videos, can be developed as a method to provide health information to low-literate patients. Studies have shown that videos can be just as effective as other forms of nonprint educational methods, even individual counseling. These studies have also demonstrated that videos are often more effective than printed materials (Doak, et al., 1996). However, long-term knowledge retention and compliance with requested behaviors are no better with videos than with printed materials.

Although a video would eliminate the need for a patient to actually read something,

readability still needs to be considered because low-literate patients have low comprehension and a limited vocabulary. Verbal communication must follow rules similar to written communication in order to be effective. When selecting or developing a video, one must consider the following (Doak, et al., 1996):

- viewing time—8 minutes or less is preferable because those with lower literacy skills tend to lose interest faster;
- behavior focus—a video should avoid factual content that is not directly relevant to the patient; focus should be placed on specific behaviors the patient should adopt;
- interaction—a video should include some interaction with the viewer, either directly from the screen or indirectly through a worksheet, which also promotes attention and long-term learning;
- cultural appropriateness—make sure that the actors on the video are believable and relate to the targeted audience;
- time of text on screen—make sure that any text presented on the screen remains long enough that a low-literacy reader has time to read it;
- beware of “hard” words—evaluate a script for readability like the text of written materials would be evaluated and avoid complex words that the viewer is unlikely to understand;
- use videos with dialogue rather than monologue—dialogue holds the attention of low-literacy viewers better; and

- pacing—make sure that the speed and tempo of the information given is appropriate for your target population; consider age as well as literacy level.

Additionally, videos should be pilot tested, just as any other educational material, to ensure appropriateness for the target population.

Both written and visual materials should also be assessed for suitability for the target population with the Suitability Assessment of Materials (SAM) evaluation instrument. This instrument was validated with 172 healthcare providers from different cultures, including Southeast Asians, Native Americans, and African Americans. SAM was originally designed for use with written and illustrated materials but has been used successfully with videos and audiotaped information as well (Doak, et al., 1996).

Training Healthcare Providers

Some research has demonstrated the effectiveness of training physicians, nurse practitioners, pharmacists, and other healthcare providers to provide low-literate patients with verbal instructions that are easier to comprehend. Such programs usually involve some form of written material to aid in retaining the verbal material the healthcare provider covers (Ammerman, et al, 1992; Davis, et al., 1998; Hussey, 1994; Kefalides, 1999; Plimpton & Root, 1994). These studies demonstrated the effectiveness of combining verbal and written instructions. However, in today's healthcare system, it is often difficult for providers to spend much time with patients; there is concern that this technique

would not be feasible outside of a research setting.

Another issue is the cultural background of the medical staff. Many physicians and staff members are from cultures different from those of their clients, and cultural differences further complicate health literacy. Medical providers and staff should be trained to be aware of and sensitive to the cultural differences that exist between themselves and their clients. This is especially important when doctors from other countries are providing care in rural areas.

Finding Ways to Get Health Information to Low-Literate Populations

Once materials are developed, effective methods must be found to disseminate these materials to the targeted populations. Low-literate people are difficult to reach through traditional channels for several reasons. Because low-literate people cannot read well and often cannot understand verbal messages, traditional media campaigns for literate people, using written or verbal script difficult for a low-level reader, rarely reach the low-literate population effectively. "Oral tradition" methods are usually overlooked as well. However, many low-literate people can understand oral instructions if these instructions are delivered by trained professionals willing to work with patients.

Additionally, many people with literacy problems do not want to admit they have a problem, are often distrustful of healthcare professionals, and won't open up to providers to ask for help. Lastly, many only visit the physician's office when they are extremely sick, which is not an optimal time to provide

preventive health education materials. Prevention programs limited to healthcare settings will not reach intended audiences effectively.

The development and marketing of materials created for low-literate populations is a crucial step to a successful health promotion campaign for this population. Social marketing, as an approach to health education and promotion, can ensure that this step in the health promotion campaign is effective. Social marketing involves the use of modern marketing methods like analyzing target audiences, pre-testing health education materials and messages, tracking marketing-process effectiveness, and using communication media and advertising to develop more effective health education campaigns (Dooley, 1996). Two key strategies in social marketing are target audience analysis and message testing. There are a few techniques that can be used to accomplish these strategies. Focus groups have been used with great success in getting audience input for developing the materials and/or for getting feedback on existing materials (Davis, Crouch, et. al, 1991; Hartman, McCarthy, Park, Schuster, & Kushi, 1997; and Rudd, et al., 1994).

The Critical Incident Technique (CIT) is a technique that has been used in a variety of fields in many different ways, but has recently been applied to health education through its use in the development and testing of nutrition information materials for low-literate adults (Betts, Dirx, & Ruud, 1993). This technique involves interviewing people from the targeted population group after they have reviewed educational materials. Subject are asked to identify or describe specific components of the materials that are both effective and ineffective

and explain why they rated the materials this way. Betts and colleagues (1993) concluded from their work that this was an extremely useful technique for the development of patient education materials. Any technique used to elicit participant input or feedback on educational materials is highly recommended.

Once materials have been developed and pre-tested, distributing them requires creative and collaborative efforts. Because many low-literate people distrust healthcare providers, do not want to open up to providers, and only visit physicians' offices when they are seriously ill, information must often be dispersed outside the healthcare setting and given by someone these people trusts. A variety of locations for health education with low-literate groups have been reported:

- Nutrition education programs for low-literate populations have been implemented as part of already existing government-sponsored nutrition-education programs like the Expanded Food and Nutrition Education Program (Hartman, et al., 1997).
- Programs covering a wide range of health topics have been offered in adult literacy classes (Demajumder, 1996; Murphy, Davis, Mayeaux, Stentell, Arnold, & Rebouche, 1996; Hohn, 1998) and English-as-a-Second-Language classes (Woodruff, Candelaria, Elder, Gichon, & Zaslow, 1996).
- Materials have also been disseminated through literacy programs and libraries (Davis, et al., 1991; Geissler, 1994).
- One study even had Senior Health Advocates (peer educators over the age of

65) giving packets of cancer screening materials to women over the age of 65 in their community at sites they frequent (List, Lacey, Hopkins, & Burton, 1994).

Because successfully tackling the health literacy problem requires expertise in a variety of areas as well as funding to develop, print, and distribute materials, many effective programs have involved collaborative efforts:

- A few programs have recruited the services of experts in graphic arts and/or video development to develop the health education materials (Demajumder, 1996; Dooley, 1996).
- Several programs have teamed health educators with literacy experts to assess the literacy problem, develop the educational materials, and/or disseminate the information (Davis & Fitzgerald, 1991; Geissler, 1994; Murphy, et al., 1996; Plimpton, et al., 1994).
- Some programs have teamed members of the target population with health experts and/or literacy experts to develop materials and implement the program (Hohn, 1998; List, et al., 1994; Rudd, et al., 1994).
- Many programs have had to rely on grants from national or local funding

agencies to ensure that their programs could be carried out (Davis, et al., 1998; Geissler, 1994; Hartman, et al., 1997; Hohn, 1998; Houts, et al., 1998; List, et al., 1994; Plimpton, et al., 1994; Woodruff, et al., 1996).

- Houts and colleagues (1999) have supported their work with funding from the Pfizer Health Literacy Fund, demonstrating that pharmaceutical companies consider this issue important as well.

Dooley (1996) sought a win-win situation with another agency so that funding for the project was unnecessary. The Bellevue Hospital Center needed patient-education materials, and the graphics department of the New York City Technical College needed a project for students to work on as part of class assignments. Another example is *Baby on the Way: Basics*, a booklet produced through a collaborative effort of Baby Talk magazine publishers, Literacy Volunteers of America, and the American College of Obstetricians and Gynecologists. This booklet's producers sought advertisers for inclusion in the booklet, which gave the publication the look of a magazine instead of an educational brochure and helped offset the costs of publication (Davis, et al., 1991).

Conclusion

As defined earlier, health literacy is a context-specific form of functional literacy, and raising health literacy for specific health topics is very context specific. For example, increasing a person's health literacy for following prescription

medication instructions will not necessarily increase her health literacy to understand the need to get regular mammograms or Pap screenings.

This distinction affects programs established to reduce harm from health illiteracy for the 36-county region under review. Needs differ slightly for each county. Although health status indicators show that heart disease and cancer are the top two causes of death for all 36 counties, programs to impact these diseases could range from dietary information to information regarding smoking, exercise, or stress management (see Appendix B). Each county may need to focus on one topic more than others. Additionally, these statistics are not sufficient to indicate true need in the counties because they do not represent the opinions of the target population: low-literate adults. Health education planning models emphasize the need to include the target population in the planning process to maximize the potential for success (Green & Kreuter, 1991; McKenzie & Smeltzer, 1997). To complicate the matter further, the low-literate population generally has different health needs than the literate population. For example, a thorough needs assessment in each county may find that the low-literate residents would prefer violence prevention or teenage pregnancy prevention programs. If programs are to be designed specifically for low-literate populations, their specific health needs must be assessed.

In fact, the prevalence of health illiteracy issues needs to be assessed throughout the

36 counties. More people in the health profession, government, and the general public need to be informed of the serious implications of health illiteracy. More low-literacy teaching materials need to become available or developed, as well as more programs that distribute these materials. Different avenues for distributing information also need to be explored, such as churches, Head Start programs, neighborhood and community centers, senior centers, and retirement centers.

Evaluation methods need to be developed to determine the effectiveness of health literacy programs and materials. These methods might include pre- and post-testing low-literate participants to determine their knowledge of the subject matter, surveying participants and health professionals regarding participants' individual health care and amount of preventive health care, and analyzing health statistics to determine improvement in participants' health and increase in routine office visits to healthcare providers.

The problem of health illiteracy can be addressed directly or as a vital component of any health prevention campaign. Regardless, it is important to assess the problem before taking action. It is also important to keep in mind that literacy requires a long-term commitment, and it may take several years to produce tangible results.

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As of November 20, 2000, the URLs for the web sites listed below and in the Appendices were correct and contained the information listed. These URLs may change or become invalid in the future. If this occurs, try contacting the site's host agency to locate the information.

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Appendix A: Demographic Characteristics for the 36-County Region

Population Statistics

Counties	1990 Population	1994 Estimated Pop.	Projected 2000 Pop.
Adams	25,371	27,201	27,200
Allen	109,755	109,234	107,800
Auglaize	44,585	46,622	47,300
Belmont	71,074	70,571	66,100
Brown	34,966	38,270	37,600
Butler	291,479	312,835	326,600
Carroll	26,521	27,849	27,400
Clark	147,548	147,856	149,600
Clermont	150,187	164,012	172,400
Columbiana	108,276	111,406	110,300
Clinton	35,415	37,666	36,400
Darke	53,619	54,141	53,500
Greene	136,731	139,906	147,300
Hamilton	866,228	867,728	873,300
Hancock	65,536	67,683	68,400
Hardin	31,111	31,436	31,000
Harrison	16,085	15,988	15,300
Highland	35,728	38,479	38,600
Holmes	32,849	35,069	36,600
Jefferson	80,298	78,737	77,600
Mahoning	264,806	263,885	268,000
Mercer	39,443	40,470	39,900
Miami	93,182	96,475	99,200
Monroe	15,497	15,293	14,700
Montgomery	573,809	572,140	588,600
Noble	11,336	11,793	11,200
Preble	40,113	41,526	42,900
Putnam	33,819	34,806	35,600
Scioto	80,327	81,858	82,500
Shelby	44,915	16,679	48,000
Stark	367,585	374,612	374,700
Trumbull	227,813	228,829	231,400
Tuscarawas	84,090	86,512	84,800
Van Wert	30,464	30,265	30,100
Warren	113,909	126,657	132,000
Washington	62,254	63,550	60,700
Entire State	10,847,115	11,102,198	11,188,300

Racial/Ethnic Group

Counties	White	Black	Hispanic	Asian American/ Pacific Islander	Native American
Adams	99.0%	0.2%	0.4%	0.1%	0.3%
Allen	87.0%	11.1%	1.1%	0.5%	0.2%
Auglaize	98.8%	0.1%	0.5%	0.4%	0.1%
Belmont	97.6%	1.8%	0.3%	0.2%	0.1%
Brown	98.5%	1.2%	0.1%	0.1%	0.1%
Butler	94.0%	4.5%	0.5%	0.9%	0.1%
Carroll	98.8%	0.5%	0.4%	0.1%	0.2%
Clark	89.9%	8.8%	0.7%	0.4%	0.2%
Clermont	98.2%	0.8%	0.5%	0.3%	0.1%
Columbiana	97.9%	1.3%	0.4%	0.2%	0.2%
Clinton	97.1%	2.0%	0.3%	0.4%	0.2%
Darke	98.6%	0.3%	0.6%	0.2%	0.2%
Greene	90.1%	7.0%	1.0%	1.5%	0.3%
Hamilton	77.3%	20.8%	0.6%	1.0%	0.1%
Hancock	95.8%	0.9%	2.6%	0.6%	0.1%
Hardin	98.2%	0.7%	0.5%	0.4%	0.2%
Harrison	97.0%	2.4%	0.3%	0.1%	0.1%
Highland	97.4%	1.9%	0.3%	0.2%	0.2%
Holmes	99.3%	0.2%	0.4%	0.1%	0.1%
Jefferson	93.3%	5.6%	0.5%	0.3%	0.2%
Mahoning	82.4%	14.8%	2.2%	0.4%	0.2%
Mercer	98.8%	0.03%	0.7%	0.2%	0.2%
Miami	96.9%	1.9%	0.4%	0.6%	0.2%
Monroe	99.5%	0.1%	0.2%	0.01%	0.2%
Montgomery	80.3%	17.7%	0.8%	1.0%	0.2%
Noble	99.5%	0.1%	0.2%	0.1%	0.1%
Preble	99.0%	0.4%	0.3%	0.2%	0.1%
Putnam	95.5%	0.1%	4.2%	0.1%	0.1%
Scioto	96.0%	3.0%	0.3%	0.2%	0.5%
Shelby	97.2%	1.4%	0.4%	0.9%	0.1%
Stark	91.7%	6.8%	0.7%	0.4%	0.3%
Trumbull	92.1%	6.6%	0.6%	0.4%	0.1%
Tuscarawas	98.6%	0.7%	0.3%	0.2%	0.2%
Van Wert	97.4%	0.6%	1.6%	0.3%	0.1%
Warren	96.7%	2.1%	0.5%	0.5%	0.2%
Washington	97.9%	1.2%	0.4%	0.3%	0.2%
Entire State	87.1%	10.6%	1.3%	0.8%	0.2%

Access to Health Care

Counties	Uninsured	Medicaid Enrollees	Medicare Enrollees
Adams	12.2%	18.5%	16.8%
Allen	12.1%	10.3%	15.6%
Auglaize	7.7%	4.2%	16.1%
Belmont	15.2%	12.8%	20.8%
Brown	10.4%	10.3%	13.2%
Butler	14.6%	7.0%	11.9%
Carroll	8.8%	9.6%	11.2%
Clark	11.3%	11.6%	16.2%
Clermont	18.1%	6.8%	8.7%
Columbiana	10.9%	11.0%	17.3%
Clinton	10.7%	8.2%	14.7%
Darke	9.6%	5.3%	15.4%
Greene	16.1%	5.9%	9.5%
Hamilton	12.1%	10.8%	15.4%
Hancock	8.2%	5.2%	13.6%
Hardin	8.6%	8.2%	14.9%
Harrison	2.9%	13.7%	20.1%
Highland	8.2%	10.0%	16.4%
Holmes	5.3%	3.1%	7.8%
Jefferson	13.7%	13.7%	20.9%
Mahoning	16.1%	13.0%	20.2%
Mercer	9.7%	3.7%	15.3%
Miami	8.2%	6.0%	14.6%
Monroe	0.0%	12.7%	17.3%
Montgomery	11.0%	10.1%	15.6%
Noble	8.0%	12.2%	13.9%
Preble	11.8%	6.1%	13.6%
Putnam	8.1%	5.0%	13.7%
Scioto	14.2%	20.0%	18.1%
Shelby	3.1%	5.9%	12.5%
Stark	11.5%	9.3%	17.4%
Trumbull	8.1%	10.6%	16.4%
Tuscarawas	12.6%	7.9%	16.9%
Van Wert	6.7%	4.2%	14.9%
Warren	15.0%	4.5%	10.0%
Washington	14.2%	9.4%	16.4%

Persons in Poverty

Counties	Under Age 18 (1990)	Estimated All Ages (1994)
Adams	35.0%	26.7%
Allen	17.9%	14.9%
Auglaize	8.1%	7.8%
Belmont	25.8%	19.3%
Brown	18.7%	17.7%
Butler	13.2%	13.7%
Carroll	14.6%	12.7%
Clark	20.5%	17.1%
Clermont	11.9%	10.6%
Columbiana	23.2%	17.9%
Clinton	14.7%	14.1%
Darke	12.1%	9.0%
Greene	12.1%	12.5%
Hamilton	19.6%	16.8%
Hancock	8.5%	8.4%
Hardin	21.8%	19.2%
Harrison	29.3%	22.0%
Highland	19.4%	17.7%
Holmes	24.5%	20.6%
Jefferson	26.3%	21.9%
Mahoning	25.0%	20.7%
Mercer	7.6%	7.0%
Miami	12.3%	9.8%
Monroe	28.8%	26.4%
Montgomery	19.5%	16.0%
Noble	22.7%	20.1%
Preble	15.6%	10.3%
Putnam	7.1%	7.4%
Scioto	37.7%	27.4%
Shelby	10.5%	9.2%
Stark	16.4%	12.7%
Trumbull	17.0%	14.9%
Tuscarawas	14.4%	13.9%
Van Wert	7.6%	7.1%
Warren	8.7%	7.6%
Washington	18.0%	16.9%
Entire State	17.8%	15.6%

Appendix B: Mortality Statistics for the 36-County Region

These statistics are age-adjusted mortality rates per 100,000 population.

County	Heart Disease	Lung Cancer	Breast Cancer	Motor Vehicles	Suicide	Homicide	AIDS	Tuberculosis
Adams	179.3	53.3	14.8	22.9	17.7	5.3	3.2	2.4
Allen	155.6	44.2	23.3	16.8	8.8	6.5	5.1	4.9
Auglaize	141.5	34.9	22.1	18.2	10.7	1.7	2.7	0.4
Belmont	167.9	43.7	19.9	12.5	14.0	3.4	3.4	2.5
Brown	152.6	60.0	30.1	31.8	16.6	4.2	3.4	1.1
Butler	152.1	46.7	23.4	14.3	10.1	4.9	5.0	2.3
Carroll	157.1	27.6	23.6	30.2	8.1	1.1	3.0	0.8
Clark	165.2	50.6	22.1	16.1	12.7	7.8	6.1	3.0
Clermont	170.1	55.4	22.9	20.6	10.8	2.2	2.9	2.7
Columbiana	182.0	41.9	23.0	22.1	11.0	1.6	2.0	1.3
Clinton	159.3	44.2	17.6	22.0	7.9	2.0	5.7	3.4
Darke	159.4	31.2	23.2	24.5	13.8	0.9	2.6	0.4
Greene	162.7	43.1	21.7	12.0	10.7	3.1	5.9	2.6
Hamilton	157.0	47.2	25.7	8.8	10.9	6.8	15.9	4.7
Hancock	140.9	33.4	25.3	18.3	7.6	3.6	3.7	1.8
Hardin	172.2	41.5	16.9	21.1	4.6	2.2	2.6	0.6
Harrison	199.0	52.3	29.8	23.0	12.4	9.6	3.7	5.0
Highland	157.5	48.0	28.3	25.7	12.9	4.0	3.9	0.6
Holmes	142.1	25.8	22.0	16.6	10.0	0.0	0.6	0.6
Jefferson	182.4	51.8	24.5	16.9	10.5	4.5	4.5	2.5
Mahoning	169.3	40.9	25.2	13.4	12.4	21.9	6.0	3.3
Mercer	164.1	30.3	18.8	22.9	13.5	1.9	2.5	2.0
Miami	170.6	36.8	20.0	18.1	10.8	3.7	4.5	1.7
Monroe	148.6	38.7	5.1	20.3	17.9	0.0	0.0	0.0
Montgomery	159.8	47.1	24.6	13.7	11.2	11.7	10.9	4.3
Noble	144.9	20.1	24.3	32.9	7.9	6.2	0.0	1.8
Preble	170.7	42.0	23.3	25.8	8.1	2.6	2.0	1.0
Putnam	133.5	31.6	25.5	25.8	13.9	1.7	0.6	0.6
Scioto	199.6	53.6	20.8	17.6	10.3	7.5	3.7	4.2
Shelby	146.4	38.4	26.6	16.5	9.5	1.8	4.0	0.9
Stark	149.2	40.1	23.8	16.2	10.5	5.7	5.2	2.1
Trumbull	171.0	41.1	21.5	18.4	12.5	6.5	3.6	2.8
Tuscarawas	173.7	37.3	25.3	19.5	10.9	1.7	1.4	1.7
Van Wert	135.4	30.3	13.0	27.3	7.5	0.0	1.3	0.7
Warren	150.4	53.8	20.2	13.7	10.7	1.3	1.8	2.6
Washington	158.9	43.6	23.4	10.6	14.2	2.1	3.2	0.6
Entire State	163.3	44.1	24.0	14.6	11.0	7.4	9.2	3.3