Disparities in Influenza Immunization Among US Adults

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In the United States, health disparities exist among ethnic minority groups, the uninsured, and those with other barriers to health care access. Health disparities exist for many diseases, but are especially pronounced for preventive health services and preventable diseases. Persons affected by disparities experience higher incidences of vaccine-preventable diseases, such as influenza, and are more likely to die from those diseases as well. Although influenza vaccines are relatively safe, inexpensive, and effective in reducing infection and disease complications, many groups in the United States do not yet benefit from this potentially lifesaving intervention. Possible explanations for disparities in influenza vaccination include: (1) barriers to access such as cost, insurance status, and language differences; (2) underestimation of personal risk and misunderstanding of vaccination risks; (3) mistrust toward the health care system; Proposed strategies to minimize these disparities include: (1) changes to health care system structural factors that serve as access barriers, (2) education to increase awareness and improve demand for vaccines, (3) involvement of community-based organizations to assess local needs and design responsive solutions.

Keywords: health disparities ■ influenza ■ immunization


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INTRODUCTION

The two overarching goals of Healthy People 2010 are to increase quality and years of healthy life, and to eliminate health disparities. These 2 goals are intimately related. To increase quality and years of life for the diverse US population, public health practitioners and health care providers must address those factors that contribute to health disparities. These disparities are traditionally viewed in terms of ethnicity, socioeconomic status, insurance coverage, and language barriers, among others. Markers of disparities include service utilization rates, and morbidity and mortality rates for population subgroups. As the US population diversifies, health parity becomes more challenging and requires novel strategies.

An important aspect of health disparities in the United States is differential access and utilization of preventive health services. Unfortunately, preventive services receive less attention than illness management in the United States. Although approximately half of all US deaths are preventable through behavioral modification, only 1% to 3% of health care expenditures over the past 40 years have been allocated for public health and preventive measures. Existing preventive health services and programs are often underutilized by groups most affected by health disparities. That is, minorities and those of lower socioeconomic status often do not benefit from these services. These populations that do not benefit from preventive services are usually ones least able to cope with the physical, psychological, social, and economic stresses of illness because they also lack access to treatment.

Vaccination is one example of a public health intervention with the potential to improve both quality of life and years of life, in keeping with the Healthy People 2010 goals. Although influenza vaccination is safe and inexpensive, it remains an underutilized public health service. As with many other illnesses, influenza disproportionately affects minorities and those of lower socioeconomic status.

As a nation with the largest per capita expenditures on health care, the United States also should lead the world in health outcomes. However, such a superior health status has not been realized. Although developed nations unquestionably have better health outcomes than developing nations, to some extent because of larger investment in health services, total expenditure is not the only factor that determines a nation’s health status. It is well established that residents of developed countries with large income disparities, such as the United States, have shorter life expectancies and poorer health outcomes than those societies with smaller income gaps. Therefore, in the best interest of all persons to achieve
decreased health disparities and equitable health care distribution. The most important place to begin addressing these issues is in preventive health care services that have the largest potential impact for the population.

HEALTH DISPARITIES IN THE UNITED STATES

Americans live in an increasingly diverse nation, where 1 in 4 persons identifies himself or herself as an ethnic minority group member. Some authorities estimate that by 2050, for every white person, there will be 1 minority group member in the United States. Obviously, ethnic identity is becoming more complex in the United States, and efforts to address health disparities must consider the impact of ethnic diversity on population health.

Ethnicity, socioeconomic status, insurance status, language differences, and access to care have all been studied for their relation to health disparities. Minority groups such as African Americans and Hispanics comprise a disproportionately large proportion of people of lower socioeconomic status, which may be in part related to historical segregation and discrimination against these groups in the United States. Related to low socioeconomic status is the fact that minorities are disproportionately uninsured or enrolled in health plans that place more limits on covered services. For example, Ahuwalia and Bolen found in their analysis of data from the Behavioral Risk Factor Surveillance System (BRFSS) that 23% of African Americans and 40.8% of Hispanics were uninsured, vs 13.1% of whites. This condition of uninsured or underinsured patients leads to higher out-of-pocket costs and fewer services obtained. Similarly, the BRFSS showed that lower educational level (a determinant of socioeconomic status) was also associated with lower levels of health insurance. It is not surprising then that minorities experience differences in health outcomes related to limited access. These disparities in health are especially pronounced for preventive services.

Health disparities are dramatically evident when one compares mortality statistics for minority and majority groups in the United States. According to the National Center for Health Statistics, the average life expectancy for a person born in the United States in 2004 is 77.8 years. However, African American men and African American women were expected to live 69.5 years and 76.3 years, respectively, vs 75.7 years for white men and 80.8 years for white women. Infant mortality and maternal mortality, important markers of a population's overall health status, are also different for minority groups. Between 2001 and 2003, infants born to African American women experienced a mortality rate of 13.6 per 1000, vs 5.7 and 5.6 per 1000 for white and Hispanic infants, respectively. Similarly, maternal mortality between 2001 and 2003 for African American women was 32.3 per 100,000, compared with 7.5 and 7.3 per 100,000 for white women and Hispanic women, respectively.

To monitor the health of minority populations more closely, the Centers for Disease Control and Prevention (CDC) implemented the Racial and Ethnic Approaches to Community Health (REACH) 2010 program in 1999. As part of this program, the CDC instituted annual Risk Factor Surveys in minority communities. This survey yields important information regarding the impact of disparities in socioeconomic status, access to care, and general health status. Results of this and similar studies are used to inform plans for future interventions.

An area of particular concern with respect to health disparities in the United States is unequal access and utilization of preventive health services such as influenza vaccination. Although influenza vaccines offer significant protection against morbidity and mortality, groups marginalized by ethnicity, socioeconomic status, language barriers, and other barriers to health care do not benefit from these public health services.

INFLUENZA DISPARITIES IN THE UNITED STATES

Influenza Virus and Vaccines

Influenza is a virulent orthomyxovirus of the upper respiratory tract that causes seasonal endemics and occasional epidemics worldwide. Influenza is associated with approximately 226,000 US hospitalizations and 36,000 deaths each year. Each spring, new influenza vaccines are created that target influenza A and B strains expected to cause disease during the upcoming winter season. Repeat vaccination is required annually because exposure to 1 strain (through vaccination or natural infection) does not confer cross-protective immunity to subsequent influenza exposures.

Available vaccines are relatively safe, inexpensive, and effective in reducing morbidity and mortality. In the United States, both an inactivated intramuscular vaccine and a live attenuated intranasal vaccine are available. The inactivated intramuscular vaccine is indicated for all persons aged 6 months or older, including pregnant women. The attenuated intranasal vaccine is indicated for healthy persons aged 2 to 49 years old who are not pregnant. People are encouraged to get vaccinated as early as the vaccine is available each fall, but health care providers continue to immunize as long as the vaccine is available.

The inactivated influenza vaccine has demonstrated 70% to 90% protection against influenza infection in healthy adults less than 65 years of age. Although protection against infection may be much lower among elderly nursing home residents (20% to 40%), the vaccine is still effective (up to 80%) in reducing influenza-associated mortality in this group. Studies of live attenuated intranasal vaccine demonstrate efficacy levels of...
85% to 89% in healthy children and adults.14

Although vaccination is recommended for all people who wish to reduce their risk of influenza infection, the Advisory Committee on Immunization Practices (ACIP) has established priority groups in case of vaccine shortages. People at high risk for influenza complications and those who care for people at high risk are the 2 major priority groups.15 The high-risk priority group includes children aged 6 months to 5 years, adults aged 50 or older, pregnant women, those living in long-term care facilities, and those with chronic medical conditions (such as human immunodeficiency virus/acquired immunodeficiency syndrome, heart disease, or lung disease).15 Health care workers, household contacts of children aged less than 6 months old, and household contacts of persons at high risk for influenza complications comprise the second priority group.15 The Healthy People 2010 goal for annual influenza vaccine coverage is greater than 60% for those aged less than 65, and greater than 90% for those aged 65 and older.15 The targeted goals are higher for the elderly because 90% of influenza deaths occur in this group.15

**Influenza Vaccination Disparities**

Despite the availability of safe and effective vaccines, substantial disparities exist in receipt of annual influenza vaccination. Annual influenza immunization rates for elderly persons in the United States still lag behind Healthy People 2010 goals, with approximately 64% to 66% receiving an influenza vaccine each year.14,15 What is even more concerning is that minority groups have significantly lower rates of influenza vaccination in comparison to whites. Estimates of influenza vaccination rates during 2004 and 2005 were 66% to 69% for whites vs only 48% to 55% for Hispanics and 45% to 50% for African Americans.13,14,15,17,19,20

The impact of suboptimal immunization rates is clear. O’Malley and colleagues reported that, in 2002, the calculated mortality rate from influenza and pneumonia for persons aged 65 to 74 was 37 per 100,000 in whites versus 50 per 100,000 in African Americans.4 This difference represents a 35% higher risk of death for African Americans from these 2 vaccine-preventable respiratory diseases. Fiscella and colleagues have estimated that 5000 African Americans and 2000 Hispanics die each year in the United States due to complications from influenza.20 If influenza vaccination rates for these 2 minority groups could be increased to those seen in the white population, there would be 1 million more influenza vaccinations among African Americans and Hispanics each year,31 and an estimated 1330 fewer deaths among African Americans and 550 fewer deaths among Hispanics from influenza.20

**POTENTIAL EXPLANATIONS FOR INFLUENZA VACCINATION DISPARITIES**

There are underlying structural factors that likely contribute to inequalities in health care access and outcomes. A common way to analyze health disparities is by using race or ethnicity to describe differences between groups. Although race itself is a troublesome concept because of its lack of biologic validity and its historical use for discrimination against minority groups,22 it is useful for comparing health outcomes between groups.25 Racism and historical subjugation have led to disproportionate levels of poverty and poorer health access and outcomes for African Americans, Hispanics, and other minority groups. These factors are cited in the health literature for their distal, intermediate, and proximate impacts on health disparities.7

The reasons for influenza vaccination disparities among minority ethnic groups are likely complex and have not been entirely elucidated. It is possible, however, that socioeconomic status, insurance status, language barriers, and access barriers all contribute to the phenomenon. Insufficient research has been performed to clarify relationships between ethnicity and other factors such as socioeconomic status that may impact health disparities for influenza vaccination.24 Despite the limited research on this topic, emerging data focus on (1) access to services, as a function of cost, and insurance and language barriers; (2) underestimation of influenza disease risks and misperception of influenza vaccine risks due to low health literacy; and (3) reluctance to accept vaccination because of mistrust.

An important barrier to preventive health services such as influenza vaccination is lack of access to care. Possible explanations for lack of access are the lower number of primary care clinics in minority neighborhoods34 and the observation that certain groups, such as African Americans, are less likely than whites to be vaccinated in settings outside of a physician’s office.25,26 Furthermore, lower income levels and socioeconomic status, which disproportionately affect minority groups, contribute to inability to obtain health insurance, which is a significant barrier to obtaining preventive health care services.24,25,26 Minorities with health insurance are also more likely to participate in plans with limited coverage for preventive services.6,8 An additional barrier to care is experienced by non-English speakers (primarily Hispanic persons in the United States), whose options are limited because few health care providers speak their native language.7,27,28 In addition to these external barriers, minority patients may have different health-seeking behaviors in comparison to whites6 and may delay or avoid seeking care.

It also has been shown that even when health care providers are present in minority communities, they are less likely to provide preventive services such as influ-
enza vaccination to their patients. In their study of African American and white Medicare beneficiaries, Bach and colleagues found that a small proportion of primary care physicians (22%) provide the majority of care (80%) for African American patients. Similarly, Reschovsky and O’Malley found that 12% of primary care providers practiced in settings where minorities accounted for greater than 70% of their patients. Compared to physicians serving primarily white patients, physicians serving minorities were less likely to be board certified, more likely to treat uninsured patients and patients with Medicaid, have lower incomes, and felt not as well equipped to provide access to high-quality care. This inability to provide high-quality care is likely associated with practicing in low-income areas, where there are fewer hospitals, specialty providers, and diagnostic services.

Even if access to care may be overcome by more-equitable distribution of resources and improved health insurance coverage, challenges remain to persuade some groups of the importance of annual influenza vaccination. Some people do not understand that “the flu” is a serious disease. Instead, they equate it with the common cold or other self-limited infections. These incorrect assumptions lead to underestimation of personal risk, and among some laypersons, the belief that influenza vaccination is unimportant. There also remains a widespread belief, particularly among minorities and those of low socioeconomic status, that the influenza vaccine is associated with severe adverse effects or can even cause the flu.

Since the 1940s, influenza vaccines have been available in several different preparations with varying efficacy and risk profiles, so it is not surprising that many persons have misperceptions regarding risks of the currently licensed vaccines. The currently recommended intramuscular influenza vaccine is made from inactivated virus and cannot cause influenza, although it occasionally causes mild soreness at the injection site, fatigue, or low-grade fever within a few days of receipt. These mild side effects are far less severe than the symptoms and potential complications experienced by those who have the flu.

A third barrier to influenza vaccination among minority populations is mistrust of the health care system and of public or government-sponsored programs. Some members of minority communities may be mistrustful of the health care system in general due to poor interactions with the health care system in the past. Others mistrust modern medicine and government-sanctioned health activities, or health care providers specifically. Minority groups recall abuses of African Americans in the Tuskegee Syphilis Study and of Jews victimized by Nazi medical experimentation. Those who recall these past violations may be reluctant to receive treatment, let alone visit health care providers, for fear that their own physicians or public health professionals may not adhere to high ethical standards of care.

**Potential Strategies to Address Disparities**

Public health professionals and health researchers have proposed a variety of ways to minimize health disparities for influenza vaccination. These ideas stem from theories regarding health disparities, professional experience, and observational and interventional studies. Recurrent themes encountered in the literature include the importance of addressing structural societal and health care industry factors that affect health care access, and improving health literacy and awareness through multiple educational and informational channels. One particularly promising strategy is the use of community-based organizations to assess community needs and institute interventions to address health disparities in preventive services such as influenza vaccination.

Structural factors are those that operate through large-scale social processes that affect large groups of people in complex ways. Some researchers believe that structural changes to the health care system are the best way to effect meaningful reductions in health disparities. Unfortunately, these factors are the most difficult to change because they are pervasive and deeply ingrained in culture. However, some authorities have been successful in reducing health disparities through this approach, and many examples of structural changes have been implemented to address influenza vaccination disparities.

In 2005, the Centers for Medicare and Medicaid Services (CMS) created policies requiring all long-term care facilities serving Medicare and Medicaid patients to offer annual influenza vaccination to all residents. The ACIP also formally recommends that influenza vaccination be offered to all hospital inpatients prior to discharge.

Structural changes also can be implemented at the health care provider level. One of the 3 guiding principles of the Racial and Ethnic Adult Disparities in Immunization Initiative (READI) is the use of evidence-based intervention strategies with health care providers and communities. The New York READI program works with medical providers to assess provider behaviors and encourage minority patient immunization. This strategy aims to reduce missed opportunities to provide influenza vaccinations when minority patients present to provider offices for other services. The Task Force on Community Preventive Services has assessed disparities in preventive services and suggested the use of reminder and recall systems, provider performance feedback, and standing orders as appropriate methods to increase influenza vaccination among minorities.

Unfortunately, providers serving minorities and other disadvantaged populations may be the least able to
implement these structural changes due to limited personnel and financial resources. However, improved Medicaid reimbursements may alleviate some of the financial constraints of providing high quality care to minority patients.14 The Veterans Health Administration (VHA) has been particularly successful in providing preventive care to minority and nonminority patients. Although disparities still exist within the VHA for influenza vaccination (71% of African Americans and 79% of Hispanics receive annual vaccination compared to 82% of whites),15 preventive services are achieved at a higher rate compared to the general population (64% receiving services in VHA vs 44% of the general population).16 As part of an incentive to continue to provide high-quality care and serve as a safety net for underserved patients, the CMS, READII, and others should work with providers and local public health agencies to create and implement the infrastructure needed to improve preventive services and decreased missed opportunities. The successes of organizations such as the VHA should be studied as models of effective structural change that have reduced health care disparities.

In addition to creating an environment more favorable for minorities to obtain annual influenza vaccines, the public health community must provide accurate information to create awareness and increase demand for these services. During the 2007-2008 flu season, November 26, 2007 to December 2, 2007, was designated as National Influenza Week to refocus public attention on the benefits, safety, and availability of influenza vaccines throughout the influenza season.17

Although these efforts are admirable, minorities may be difficult to reach via traditional public awareness campaigns that use print or electronic media. Well-designed brochures and reminder systems have been shown to increase influenza vaccination rates among minority groups.18 The use of socially and culturally appropriate social marketing, coordination with advocacy groups, and use of the media (through public service announcements or newscasts) are all proposed methods to increase awareness.19 As people become more aware of the benefits, they are more likely to seek out opportunities for influenza vaccination and are more readily accept these services when offered.

One emerging approach to addressing health disparities that is particularly promising is the use of community-based organizations (CBOs) to assess community needs and provide community-based solutions. CBOs are well suited to address local health challenges involving the physical, social, and cultural environments in which they operate. They are ideally positioned to engage community members to effect solutions. It is vitally important that community-based endeavors have buy-in from community members and the organization. If an outside group takes control of a community intervention, its effects likely will be short lived and of minimal impact.

CBOs are well situated to tailor health education messages to fit local social and cultural norms, thereby increasing chances for success. The use of community-based prevention marketing, an approach that engages community groups to apply concepts of social marketing to effect health behavior change,41 may be useful in improving influenza vaccination rates among minorities. This approach builds community capacity to address local health issues and capitalizes on an organization's reputation and physical location within the community.42

The READII is an example of an initiative that focuses on community-based strategies. Two of its guiding principles are to develop local community buy-in for project design and to engage stakeholders.17 The New York READII works with multiple CBOs, and the Minnesota READII works with local organizations and clinics to provide free vaccines.17 CBOs have been at the forefront in hosting health fairs and outreach programs to offer influenza vaccinations in nontraditional settings.43 44 45 It is likely that CBOs will continue to play an increasingly important role in improving health care and preventive service access for minority populations.

CONCLUSIONS

Despite the high level of health care services available in the United States, many groups still experience health care disparities. Those primarily impacted are those of minority ethnic groups, of low socioeconomic status, or who have limited access to health care services. These factors are particularly important in determining disparities in utilization of preventive services, such as influenza vaccination. It is vital that public health professionals and health care providers work to understand and address the reasons for these continued disparities. An important strategy for public health professionals is to engage community-based organizations to address local health disparities at their core and move towards more equitable health outcomes.

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INFLUENZA IMMUNIZATION DISPARITIES


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