Introduction
Hypertension—systolic and a diastolic blood pressure level of >140/90 mmHg—is a major risk factor for cardiovascular diseases and stroke.\(^1\) Historically, many people with hypertension have been unaware of their condition, but ongoing education and prevention efforts have led to an increase in the number of individuals with controlled or treated high blood pressure.\(^2\) Despite these successes, 31% of US adults continue to suffer from hypertension, with minorities being more likely to have the condition. Of these, 25% have uncontrolled blood pressure.\(^3,4\)

Data from the National Health and Nutrition Examination Survey (NHANES) for 1999–2002 showed that the hypertension prevalence rate was highest among African Americans—almost 50% higher than white people. Minorities face a number of barriers to controlling hypertension, and understanding these barriers is a first step to appropriately selecting and targeting effective treatment strategies.
treatment plans. Some of the barriers to controlling hypertension for minorities include perceived judgment and/or mistreatment, stress, inability to adhere to medications, limited healthcare access and utilization, low health literacy, distrust in clinical community, power struggles, and language/cultural barriers. African Americans develop hypertension at an early age, reach advanced levels of hypertension, are prone to experience further complications, and are less likely to attain control of their hypertension.

**Burden on Society**
Hypertension is highly prevalent among the adult population. The Framingham Heart Study found that the lifetime risk for developing high blood pressure among non-hypertensive adults in the United States is 90%. Hypertension is a risk factor for other cardiovascular conditions, such as heart disease or stroke; therefore, this lifetime risk underscores the population risk of hypertension. As a result, 116 million people will have one or more forms of heart disease or stroke, and almost 25 million people are expected to die from heart disease or stroke by 2030.

Prevalence and mortality associated with hypertension is higher among minorities, particularly African Americans. Hypertension is a leading cause of preventable death in the United States and among African Americans. African Americans have the highest risk for hypertension-related deaths (see Table 1). Further, among all racial/ethnic groups, African American women have the highest prevalence (45%) and lowest control of high blood pressure (59%). According to Dodani et al, “African Americans have 1.3-times greater rate of nonfatal stroke, a 1.8-times greater rate of fatal stroke, a 1.5-times greater rate of death due to heart disease and a 4.2-times greater rate of end-stage kidney disease” compared to white people.

Approximately 25% of all Hispanic adults are hypertensive in the United States. Hispanic people are also less likely to be screened and receive treatment for hypertension. American Indians are 1.3 times more likely to have high blood pressure compared to white people. There are limited hypertension data for other minority groups.

Minorities with hypertension are less likely to have their blood pressure under control. According to the Framingham Heart Study, less than half of all men (38%) and women (23%) aged 80 years and older suffering from hypertension had their blood pressure under control per established guidelines. These trends were similar for men (38%) and women (38%) aged 60 years or younger.
NHANES data examining the 2001–2010 time period also showed African Americans were more likely to have uncontrolled hypertension than white people and Hispanic people. Poor adherence to medication has been identified as a major contributor to uncontrolled hypertension among African American patients. While the treatment rates for African Americans were 12.9% higher than white patients, the control rate among those treated was 18.1% lower than those of white patients. It has also been shown that African Americans who have uncontrolled high blood pressure do not take any antihypertensive medications and are usually young men who do not have frequent contact with a physician.

Due to its high prevalence, hypertension is a costly condition. Healthcare costs due to hypertension alone are speculated to reach $258.3 billion by 2030. Further, it is estimated that over $3.1 billion in prescription drug costs and other consequences of high blood pressure could be avoided through understanding the most cost-effective options. A study that examined costs for several conditions found that hypertensive patients incurred the highest costs for treatment and drug expenditures. Hypertension is also one of the top 10 most costly health conditions for US employers. The Milken Institute found that among the most common chronic diseases, low and lost productivity was highest for hypertension, with close to $3 billion in costs. As the number of people with hypertension continues to increase, research to better explain trends in hypertension risk and evidence-based practices to improve patient-centered outcomes will be imperative for addressing the hypertension epidemic.
Table 1. Prevalence, Use of Antihypertensive Medication, Uncontrolled, and Mortality Rates by Race

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Black</th>
<th>Hispanic</th>
<th>American Indian/Alaska Native</th>
<th>Asian American</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence rate</td>
<td>28.8%</td>
<td>42.0%</td>
<td>25.5%</td>
<td>27%</td>
<td>20%</td>
</tr>
<tr>
<td>Use of antihypertensive</td>
<td>78.5%</td>
<td>75.3%</td>
<td>68.1%</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncontrolled*</td>
<td>41.2%</td>
<td>58.8%</td>
<td>68.2%</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>Mortality rate</td>
<td>15.6 per 1000a</td>
<td>21.3 per 1000d</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
</tbody>
</table>

* Includes treated and untreated

Sources:

Options for Addressing the Issue

**Drug therapy.** Pharmacological treatment is needed for most patients to control their blood pressure. However, a segment of the population is resistant to hypertensive medications and may require a combination of three or more drugs to achieve blood pressure control. The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) found that only one-third of participants’ blood pressures was controlled with one drug as compared to two-thirds of the participants whose blood pressure needed multiple antihypertensive agents to be controlled. Three other large randomized controlled trials that have shown success in controlling high blood pressure include antihypertensive agents to achieve the control.
Non-pharmacological interventions. National guidelines recommend that management of hypertension should begin with lifestyle modifications and be complemented with drug therapy. Some of those methods include home blood pressure monitoring, health coaching, diet modifications, patient-provider communication, pharmacist interventions, and telemedicine. Systematic reviews suggest that the use of home monitors may improve control of hypertension. An Agency for Healthcare Research and Quality (AHRQ) study comparing the effectiveness of self-blood pressure monitoring across 48 studies found that standardized self-monitoring should be implemented in order to determine—with additional research—how effective this method is.

Physician communication and rapport-building are important factors that enhance patient trust, particularly among African American patients, and have been shown to improve blood pressure control when implemented into patient care. A systematic review and meta-analysis conducted by Machado et al, found that systolic blood pressure is sensitive to pharmacists’ interventions, including methods using pharmacist blood pressure evaluations, pharmacist counseling on controlling and treatment, pharmacist blood pressure management, and pharmacist input in primary care and support in patient decision making. Researchers also recommended the need for high-quality studies to determine effectiveness of pharmacist interventions to control blood pressure. Other interventions to improve patient education and increase support from health professionals may lead to compliance with prescriptions and doctor’s instructions, which could improve blood pressure control.

Other methods that foster behavior change, such as the Dietary Approaches to Stop Hypertension (DASH) plan, have shown that inclusion of heart healthy foods that are low in cholesterol and sodium have been very beneficial in promoting weight loss, reduction of blood pressure in hypertensive individuals, and reduction in low-density lipoproteins (LDLs). Approaches that focus on empowering patients to be involved and “in control” of their condition, such as using home blood pressure monitoring and the health coaching method, have been shown to be effective in controlling hypertension, yet the extent of the advantage is unknown.

Quality improvement strategies as an avenue to control hypertension. Another systematic review assessed the effectiveness of quality improvement as an approach to hypertension management. Quality improvement strategies, such as provider education, provider reminders,
patient education, self-management, audit and feedback, team change, or financial incentives, have shown to lower systolic blood pressure by as much as 10mmHg. The review suggested that team change, a method that involves developing and utilizing a multidisciplinary team to assist in disease management, was associated with the greatest reduction in hypertension outcomes. Outcome measures selected for the review across all studies were limited, hence our limited understanding of effective quality improvement strategies.

**Potential for New Information to Improve Care and Patient-Centered Outcomes Rapidly**

The understanding of high blood pressure and how to manage it in clinical settings has advanced greatly. There is general consensus on the medications that are most effective in lowering blood pressure. However, there is little information on the best alternate option if the pressure remains elevated despite drug treatment. Current evidence for interventions that included patient education, home blood pressure monitoring, decision support from pharmacists, and computerized decision-support systems for physicians shows that implementing one or a few of these processes into daily care may yield results that are different across the spectrum of delivery models. Several studies have evaluated strategies that bundle and implement multiple delivery methods to control hypertension in minority populations. One concluded that the most probable strategy to control hypertension would include a combination of several techniques. While the bundling of delivery methods has been proven effective, large-scale, stakeholder-driven studies evaluating its effectiveness across multiple communities is nonexistent.
References


*PCORI Topic Brief—Hypertension in minorities*


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43. Alvarado M. *Patient-Centered Medical Home Technology Effects on Hypertension and Diabetes Control* [dissertation]. Houston, TX: The University of Texas, School of Biomedical Informatics; 2012.


