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## Review Article

## Epidemiology of hypertension



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## ABSTRACT

Hypertension is an epidemic affecting one billion people and is the commonest risk factor for death throughout the world. World health statistics 2012 has estimated the prevalence of hypertension to be 29.2% in males and 24.8% in females. Approximately 90 percent for men and women who are non hypertensive at 55 or 65 years will develop hypertension by the age of 80–85. Hypertension is not limited to rich population and affects countries across all income groups. Out of total 58.8 million deaths worldwide in year 2004, high blood pressure was responsible for 12.8% (7.5 million deaths). World over hypertension is responsible for 51% of cerebrovascular disease and 45% of ischemic heart disease deaths. Unlike the popular belief that hypertension is more important for high-income countries, people in low- and middle-income countries have more than double the risk of dying of hypertension.

Understanding epidemiology of hypertension will significantly help in decreasing the burden of associated morbidity and mortality. In America, with the help of programs such as National High Blood Pressure Education Program (NHBPEP), the awareness about hypertension has improved from 51 percent in the period 1976–1980 to 70 percent in 1999–2000 and as a result hypertension related morbidity and mortality has substantially improved. Since 1972, age-adjusted death rates from stroke have decreased by about 60% and that by coronary heart disease has decreased by about 50 percent. Recent WHO initiative on non communicable diseases is expected to decrease hypertension related mortality and morbidity globally.

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## 1. Introduction

Throughout the world, poorly controlled blood pressure is the most common risk factor for death. Understanding of epidemiology is important for several reasons. Study of prevalence helps in spreading awareness about this silent killer which has helped in reducing morbidity and mortality over the years. However, even in the USA, in spite of structured effort for education about hypertension, 30% of adults are not aware about their disease. Developing world is also experiencing an

epidemiology change. With economic growth, urbanization and lifestyle change, hypertension is increasing in prevalence. People die early of hypertension in developing world and so health planning which was strongly oriented toward infection control now needs to be revised. Systolic blood pressure (SBP) is also increasing with increasing age expectancy. Hypertension is increasing in women. After diabetes hypertension is the commonest antecedent for end stage renal disease which again is increasing in number. Epidemiology helps in understanding involved risk factors and formulating preventive

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strategies, both for primary prevention and also for secondary prevention of associated complications.

## 2. Worldwide prevalence of hypertension

Hypertension is a worldwide epidemic. It is estimated that prevalence of hypertension in the world is about one billion<sup>1</sup> and this is the most leading global risks for mortality. With advancing age, the prevalence of hypertension increases. In the USA hypertension affects more than half of people in the age range of 60–69 years and about three-fourths of people who are of 70 years of age or older.<sup>2</sup> Due to the fact that SBP increases with advancing age, there is increase in the incidence and prevalence of hypertension in aging population.<sup>3</sup> Approximately 90 percent for men and women who are non hypertensive at 55 or 65 years will develop hypertension by the age of 80–85.<sup>4</sup>

Hypertension is not limited to rich population. It affects low- and middle-income group countries as well. Out of total 58.8 million deaths worldwide in year 2004, hypertension caused 7.5 million (12.8%) of deaths. In high-income countries it was responsible for 16.8% of deaths second only to tobacco use (17.9% deaths). In low-income group countries it was responsible for 7.5% deaths second only to childhood underweight (7.8% deaths). Whereas in middle-income countries it was responsible for maximum number (17.2%) of deaths.<sup>5</sup>

Prevalence of hypertension was reported as low as 1.2–4 percent in studies involving Indian urban population in the mid-1950s. This was because hypertension in these studies was defined as blood pressure equal to or more than 160 systolic and 95 diastolic using older WHO guidelines. Prevalence of hypertension in India has been found to increase over the years. Studies in 1960s have reported a prevalence of 5 percent and studies in 1990s have reported a prevalence of 12–15 percent. In recent studies, where revised criteria was used, prevalence have been found to be high affecting 25 percent of urban and 10 percent of rural population. As per one estimate, there may be at least 31.5 million hypertensive in rural and 34 million in urban India.<sup>6</sup>

World health statistics 2012<sup>7</sup> has estimated the prevalence of hypertension to be 29.2% in males and 24.8% in females (Table 1). In India hypertension affects 23.10 percent of men and 22.60 percent of women. As such, the prevalence

in India is low as compared to world figures. For detail country wise data one can access the information available at the WHO website (<http://apps.who.int/gho/data/view.main.2464>).

## 3. Changing trends in epidemiology

Life styles and preventive strategies are not uniform across various nations and throughout the world health pattern is changing over time. As such epidemiology of hypertension is changing world over. In a recent study involving 5.4 million participants from 199 countries and territories trends in blood pressure were analyzed.<sup>8</sup> On average, blood pressure has decreased globally since 1980. SBP has decreased by 0.8 mmHg per decade in men and 1.0 mmHg per decade in women. But this downward trend is not uniform across various regions of world. In countries with high-income, mean blood pressure has decreased substantially. In Western Europe and Australasia, SBP decreased by 3.5 mmHg or more per decade in female. In males, SBP fell most in North America (2.8 mmHg per decade) followed by Australasia and Western Europe (more than 2.0 mmHg per decade). In the United States mean SBP in males decreased from 131 mmHg in 1980 to 123 mmHg in 2008 and in females SBP decreased from 125 mmHg to 118 mmHg.

In contrast to the favorable trends in high-income countries, mean SBP is highest in low-income and middle-income countries and is rather increasing over the years. SBP has increased by 0.8–1.6 mmHg per decade in males and 1.0–2.7 mmHg per decade in females in regions like Oceania, Africa and Asia. SBP in females is highest in some African countries with mean of 135 mmHg or greater and that in males is highest in Baltic and Africa reaching up to 138 mmHg or more. People in Western Europe have highest SBP in high-income regions.<sup>9</sup> Age standardized prevalence of raised blood pressure among adults by WHO region over the period 1980 and 2008 is given in Fig. 1.

Changes in the trends of epidemiology needs to be understood. Developing countries are mainly burdened by infectious diseases such as diarrhea and pneumonia but as they develop, the types of diseases change from communicable to non communicable, such as cardiovascular disease and cancers (<sup>5</sup>, Fig. 2). This change is caused by various factors leading to overall improvement in the medical care of that country. Infectious diseases have decreased in

**Table 1 – WHO 2012 data on hypertension. Reference: <http://apps.who.int/gho/data/view.main.2540> Global Health Observatory Data Repository.**

| WHO region            | Year | Age group | Raised blood pressure (SBP $\geq$ 140 or DBP $\geq$ 90) (age-standardized estimate) |                  |                  |
|-----------------------|------|-----------|---|------------------|------------------|
|                       |      |           | Male  | Female           | Both sexes       |
| Africa                | 2008 | 25+       | 38.1 [34.0–42.4]  | 35.5 [31.7–39.3] | 36.8 [34.0–39.7] |
| Americas              | 2008 | 25+       | 26.3 [23.0–29.9]  | 19.7 [17.2–22.4] | 23.0 [20.9–25.1] |
| South–East Asia       | 2008 | 25+       | 25.4 [20.7–30.3]  | 24.2 [20.1–28.6] | 24.9 [21.8–28.1] |
| Europe                | 2008 | 25+       | 33.1 [29.9–36.4]  | 25.6 [22.8–28.4] | 29.3 [27.2–31.5] |
| Eastern Mediterranean | 2008 | 25+       | 30.7 [26.1–35.8]  | 29.1 [24.8–33.5] | 30.0 [26.7–33.2] |
| Western Pacific       | 2008 | 25+       | 28.7 [24.8–32.8]  | 23.7 [20.5–27.3] | 26.3 [23.7–29.0] |
| Global                | 2008 | 25+       | 29.2 [26.9–31.6]  | 24.8 [22.8–26.9] | 27.0 [25.5–28.6] |

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