

*Original Article*

# Awareness and Treatment of Hypertension and Hypercholesterolemia in Japanese Workers: The High-Risk and Population Strategy for Occupational Health Promotion (HIPOP-OHP) Study

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The objective of this study was to clarify the awareness and treatment status of hypertension in Japanese workers, comparing with those of hypercholesterolemia. The subjects were 6,186 workers (age 19 to 69 years), who worked at 12 workplaces in Japan and who continuously participated in the High-risk and Population Strategy for Occupational Health Promotion (HIPOP-OHP) study at the baseline (1999 or 2000) and the subsequent year (2000 or 2001). No intervention was performed during the study period. Blood pressure and total cholesterol level were measured at baseline. Awareness and treatment status were examined by a self-administered questionnaire in the following year. Untreated subjects were defined as those were not aware of hypertension (or hypercholesterolemia) or those not taking medication and not undergoing lifestyle modification. The percentages of subjects with hypertension defined as aware were 65.7% in men and 72.7% in women, respectively. The percentages of subjects with hypercholesterolemia defined as aware were 55.7% in men and 58.6% in women, respectively. In subjects 40 years and older, the awareness rate for hypertension was significantly higher than the awareness rate for hypercholesterolemia (75.0% vs. 59.2%,  $p < 0.001$ ). The percentage of untreated subjects with hypertension was significantly lower than the percentage of untreated subjects with hypercholesterolemia (41.0% vs. 57.1%,  $p < 0.001$ ). Although Japanese workers 40 years old have a higher awareness of and are more often treated for hypertension than for hypercholesterolemia, there are still many unaware and untreated individuals with either disease in all age groups. It is important to increase the awareness of risk factors in individuals with positive findings for these conditions. (*Hypertens Res* 2007; 30: 921–928)

**Key Words:** hypercholesterolemia, hypertension, awareness, treatment, Japanese worker

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## Introduction

Hypertension and hypercholesterolemia are major risk factors for cardiovascular diseases such as stroke and ischemic heart disease (1–4). Screening for risk factors and their management are important for the reduction of deaths from cardiovascular diseases. Most developed countries have guidelines for the management of the risk factors for these diseases (5–7). Individuals with positive findings for these risk factors must first be made aware that they have these risk factors. This should increase their motivation to improve these risk factors. Then, they can receive appropriate guidance for lifestyle improvements or start medication. Many European and U.S. studies have reported on the awareness rates and treatment of risk factors for cardiovascular diseases (8–11). However, there have been only a few reports on the awareness of hypertension and hypercholesterolemia in Asians (12, 13). Furthermore, most of the studies on awareness used the “recall method,” which is based on subjects’ memories. There have not been any studies that have prospectively examined awareness.

The objectives of this study are to examine the self-awareness of the past medical histories of hypertension or hypercholesterolemia based on laboratory data in the previous year and to clarify the percentage of untreated subjects with hypertension or hypercholesterolemia. The subjects in this study are 6,186 workers from 12 workplaces in Japan. Our working hypothesis is that Japanese people, who have been exposed to the danger of stroke from hypertension for many years, have a higher rate of awareness of hypertension than hypercholesterolemia, and consequently, are treated more often for hypertension than for hypercholesterolemia.

## Methods

### Study Population

We used the baseline and following year’s data from a large intervention study named the High-risk and Population Strategy for Occupational Health Promotion (HIPOP-OHP) study. The details of this study have been described elsewhere (14). Briefly, the HIPOP-OHP study was conducted using both a population strategy and a high-risk strategy to establish preventative measures to improve cardiovascular risk factors. It was a 6-year study conducted from 1998 with subjects from 12 workplaces throughout Japan. The 12 workplaces participating in the study consisted of 6 sites (companies A–F) in the intervention group, and 6 sites (companies G–L) in the control group. In the intervention group, individual lifestyle modifications for subjects with positive findings of hypertension, hypercholesterolemia, diabetes or a smoking habit were performed as the high-risk strategy. Concurrently, environmental improvements were performed based on the population strategy (such as improvements of company cafeterias, promo-

tional campaigns to increase physical activity, and inspection of the designation of smoking areas). In the control group, only teaching materials for individual lifestyle modification were provided. The sites in the intervention group included the Tokyo headquarters of a life insurance company (company A) and factories of electrical product manufacturers (companies B, C, E, and F). Among the latter 4 companies, company C was located in eastern Japan (the Kanto region) and the remaining 3 companies were located in western Japan (the Kinki and Hokuriku regions). Company D was the factory of a chemical company located in western Japan. The sites in the control group included the factory of a chemical company located in Tokyo (company H) and four electrical product manufacturers (companies G, I, J and K). Among the latter 4 companies, companies G and K were located in eastern Japan (the Kanto region), and companies I and J were located in western Japan (the Kinki and Hokuriku regions). Company L was the laboratory of an electrical products manufacturer.

The subjects were 6,186 individuals aged 19 to 69 years who worked at the aforementioned companies and who participated in at least the first 2 years of the HIPOP-OHP study (*i.e.*, the baseline year [1999 or 2000] and subsequent year [2000 or 2001]). The data were collected at the time of the annual health checkups which all companies in Japan are obligated to perform in accordance with the “Law for Workers’ Safety and Health.” Therefore, the subjects were almost all of those worked at the aforementioned companies. Eighty-nine point eight percent of participants from the baseline examination took part in the following year’s examination. About 10% of the subjects were lost to follow-up due to retirement or moving off to another worksite within the same corporation.

### Data Collection and Standardization

The collection of all data was performed by a standardized method using the same format (14). The blood pressure was measured twice in each subject after sitting at rest for at least 5 min with an hourglass. The mean value of the two measurements was used for analysis. The same automatic sphygmomanometer (BP-103iII; Nihon Colin, Komaki, Japan) was used at all companies but one (Company L used TM-2654 and TM-2656; A&D Co., Ltd., Tokyo, Japan). For the total cholesterol levels, an international standardization of lipid measurement was performed *via* the Osaka Medical Center for Health Science and Promotion, which is a member of the U.S. Cholesterol Reference Method Laboratory Network (CRMLN) (15). Each laboratory, which measured serum samples for each workplace, was responsible for the standardization of serum total cholesterol measurements under the control of the Osaka Medical Center for Health Science and Promotion.

Based on the 1999 WHO/ISH guidelines (16), we defined hypertension as a systolic blood pressure (SBP)  $\geq$  140 mmHg,

**Table 1. Mean Blood Pressure and Serum Total Cholesterol Levels ( $\pm$ SD) of Workers in 12 Workplaces in 1999–2000, HIPOP-OHP Study, Japan**

Ages	Number of subjects	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)	Number of subjects	Total cholesterol (mg/dL)
<b>Men</b>					
–20s	908	117.1 $\pm$ 13.3	66.9 $\pm$ 8.3	575	174.6 $\pm$ 30.6
30s	1,888	118.0 $\pm$ 14.4	71.3 $\pm$ 9.8	1,085	193.7 $\pm$ 33.8
40s	1,273	118.9 $\pm$ 16.2	75.3 $\pm$ 11.5	1,274	203.6 $\pm$ 33.0
50s–	834	121.6 $\pm$ 18.6	77.1 $\pm$ 12.6	835	203.5 $\pm$ 31.1
All ages	4,903	118.7 $\pm$ 15.5	72.5 $\pm$ 11.1	3,769	196.4 $\pm$ 34.0
<b>Women</b>					
–20s	306	104.2 $\pm$ 11.3	60.9 $\pm$ 7.6	87	167.5 $\pm$ 25.2
30s	452	106.3 $\pm$ 13.5	64.0 $\pm$ 9.3	173	179.4 $\pm$ 31.4
40s	318	113.3 $\pm$ 17.0	68.8 $\pm$ 11.5	318	198.2 $\pm$ 29.8
50s–	207	116.8 $\pm$ 19.1	71.1 $\pm$ 12.2	205	214.0 $\pm$ 33.4
All ages	1,283	109.2 $\pm$ 15.7	65.6 $\pm$ 10.7	783	194.8 $\pm$ 34.2

a diastolic blood pressure (DBP)  $\geq$ 90 mmHg, or the taking of an antihypertensive medication at the baseline examination. According to the ATP III guidelines (5), hypercholesterolemia was defined as a total cholesterol level  $\geq$ 240 mg/dL or the taking of a hypolipidemic medication at the baseline examination. The subjects were informed about their baseline results orally and in written notices.

Self-awareness and treatment were examined using the questionnaire shown in the Appendix Table. The questionnaires were distributed to and filled in by the subjects prior to the physical examinations in the year following the baseline survey. The subjects, who were defined as having hypertension (or hypercholesterolemia) based on the baseline survey, were categorized as those with or without awareness of hypertension (or hypercholesterolemia). Among the subjects who were defined as having positive findings of hypertension (or hypercholesterolemia) based on the baseline survey, those who answered “I have never been told that I have hypertension (or hypercholesterolemia)” on the questionnaire of the following year’s survey were defined as unaware. All other subjects with positive findings were categorized as aware subjects. The untreated subjects were defined as those who had been determined to have hypertension (or hypercholesterolemia) at the baseline examination, but who answered, “I have never been told that I have hypertension (or hypercholesterolemia)” or “I am not taking medicines and not undergoing lifestyle modification” in the following year’s survey.

### Statistical Analysis

The HIPOP-OHP study is an interventional study with the objective of improving hypertension and hypercholesterolemia. For 1 year from the baseline examination, protocol creation was accomplished in order to generate a population strategy. Even for the intervention group, no intervention *via* individual lifestyle modification and population strategy was

implemented. Furthermore, no attempts were made to improve the awareness of the patients about their disease. It has been reported previously that there were no changes in the intervention and control groups for the blood pressures, total serum cholesterol levels, and proportions of subjects taking lipid-lowering or antihypertensive medication (17). Furthermore, there was no significant difference in the proportion of aware subjects between the intervention and control groups. Therefore, we analyzed the intervention and control groups as a single group. Gender-specific analysis was also performed. Comparisons of the proportions of aware and untreated patients between the hypertensive and hypercholesterolemic groups were performed using an  $\chi^2$  test. Statistical analysis was performed using SPSS software, version 11.0 for Windows (SPSS, Chicago, USA). Values of  $p < 0.05$  were considered statistically significant.

### Results

Table 1 shows the blood pressures and total cholesterol levels by gender and age group. The mean age of the subjects was 38.8 $\pm$ 9.5 years for men and 37.9 $\pm$ 9.8 years for women. The mean values of SBP, DBP and total cholesterol were 118.7 $\pm$ 15.5 mmHg, 72.5 $\pm$ 11.1 mmHg and 196.4 $\pm$ 34.0 mg/dL in men; and 109.2 $\pm$ 15.7 mmHg, 65.6 $\pm$ 10.7 mmHg, and 194.8 $\pm$ 34.2 mg/dL in women, respectively. The mean age of the subjects with hypertension and hypercholesterolemia were 43.5 $\pm$ 9.5 years and 44.4 $\pm$ 7.8 years in men; and 47.6 $\pm$ 8.0 years and 49.6 $\pm$ 6.1 years in women, respectively. The mean age of the subjects with hypercholesterolemia was higher than that of the subjects with hypertension.

Table 2 shows by gender and age the percentages of subjects with hypertension in the first year of the examination, their awareness of hypertension in the following year, and their level of management. The percentage of subjects with hypertension increased with age in both men and women. The

**Table 2. Number of Subjects, Prevalence and Rates of Self-Awareness and Treatments of Subjects with Positive Findings of Hypertension, Workers in 12 Workplaces, 2000–2001, HIPOP-OHP Study, Japan**

	Number of subjects (n)	Subjects with positive findings of hypertension <sup>a</sup> (n (%))	Awareness of hypertension <sup>b</sup>	Treatments <sup>b</sup> (n (%))			Untreated group <sup>c</sup>
			Aware (n (%))	Treated group			
				Medication + lifestyle treatment	Medication only	Lifestyle treatment only	
<b>Men</b>							
–20s	908	55 (6.1)	20 (36.4)	1 (1.8)	0 (0.0)	8 (14.5)	46 (83.6)
30s	1,888	189 (10.0)	100 (52.9)	12 (6.3)	6 (3.2)	37 (19.6)	134 (70.9)
40s	1,273	201 (15.8)	153 (76.1)	36 (17.9)	20 (10.0)	57 (28.4)	88 (43.8)
50s–	834	226 (27.1)	168 (74.3)	71 (31.4)	22 (9.7)	45 (19.9)	88 (38.9)
<b>Women</b>							
–30s	758	15 (2.0)	10 (66.7)	1 (6.7)	0 (0.0)	4 (26.7)	10 (66.7)
40s	318	31 (9.7)	24 (77.4)	7 (22.6)	3 (9.7)	10 (32.3)	11 (35.5)
50s–	207	42 (20.3)	30 (71.4)	12 (28.6)	4 (9.5)	8 (19.0)	18 (42.9)

<sup>a</sup>Systolic blood pressure  $\geq 140$  mmHg, diastolic blood pressure  $\geq 90$  mmHg, or subjects taking antihypertensive medication (classification based on baseline examination data of 1999–2000). <sup>b</sup>Results from a questionnaire survey of the following year, 2000–2001. <sup>c</sup>“Subjects not aware of hypertension” or “neglected (not taking medication and not receiving lifestyle treatment).”

percentage ranged from 6.1% to 27.1% in men and 2.0% to 20.3% in women. The percentage for all ages was 13.7% in men and 6.9% in women. For both genders, the number of subjects with awareness of their hypertension increased with age. The percentage ranged from 36.4% to 76.1% in men and 66.7% to 77.4% in women, and the percentage for all ages was 65.7% in men and 72.7% in women. For women, approximately 70% of the subjects in all age groups 30 years and older had awareness of their hypertension. The percentage of subjects receiving no treatment for hypertension (such as medication and/or lifestyle modification) ranged from 38.9% to 83.6% in men and 35.5% to 66.7% in women. There was an inverse association between the awareness rate of hypertension and the untreated rate of hypertension in both men and women.

Table 3 shows the percentages of subjects with positive hypercholesterolemia findings in the first year, their awareness of hypercholesterolemia in the following year, and their level of management. The percentage of hypercholesterolemic subjects in the different age groups ranged from 2.6% to 16.3% in men and 2.3% to 28.8% in women, and the percentage for all ages was 12.2% in men and 12.6% in women. The number of hypercholesterolemic subjects tended to increase with age. The percentage of subjects with awareness of their hypercholesterolemia increased with age in both men and women. The percentage of subjects with awareness of their hypercholesterolemia in the different age groups ranged from 20.0% to 65.4% in men and 16.7% to 62.7% in women, and the percentage for all ages was 55.7% in men and 58.6% in women. The percentage of untreated hypercholesterolemic subjects ranged from 47.8% to 86.7% in men and 47.5% to 83.3% in women. There was an inverse association between

awareness rate of hypercholesterolemia and untreated rate of hypercholesterolemia.

Table 4 shows a comparison of the awareness and treatment rates for hypertension and hypercholesterolemia. In subjects 39 years and younger, there was no significant difference between hypertension and hypercholesterolemia in awareness rate and in the rate of untreated subjects, when data from both genders were combined. The hypertension awareness rates were significantly higher than the hypercholesterolemia awareness rates in subjects 40 years and older. In conjunction with an increased awareness of hypertension, the percentages of untreated hypertensive subjects were significantly lower than the percentages of untreated hypercholesterolemic subjects. There were no differences for body mass index and rate of treated subjects at the baseline examination between subjects with awareness of hypertension and those with awareness of hypercholesterolemia in men, and no difference for the rate of treated subjects at the baseline examination between these two disease groups in women, although the mean body mass index of subjects of women with awareness of hypertension was higher than that of women with awareness of hypercholesterolemia.

The awareness of hypertension was higher than the awareness of hypercholesterolemia in 9 of 12 companies (all companies except H, I, and J). In addition, the percentage of subjects not treated for hypertension was lower than that not treated for hypercholesterolemia in 9 of 12 companies (all companies except D, E, and H) (not indicated in the table). Since the number of female subjects was small in each workplace, we could not analyze the data by gender at the individual sites.

**Table 3. Number of Subjects, Prevalence and Rates of Self-Awareness and Treatments of Subjects with Positive Findings of Hypercholesterolemia (>240 mg/dL), Workers in 12 Workplaces, 2000–2001, HIPOP-OHP Study, Japan**

	Number of subjects (n)	Subjects with positive findings of hypercholesterolemia <sup>a</sup> (n (%))	Awareness of hypercholesterolemia <sup>b</sup>	Treatments <sup>b</sup> (n (%))			
			Aware (n (%))	Treated group			Untreated group <sup>c</sup>
				Medication+ lifestyle treatment	Medication only	Lifestyle treatment only	
<b>Men</b>							
–20s	575	15 (2.6)	3 (20.0)	0 (0.0)	1 (6.7)	1 (6.7)	13 (86.7)
30s	1,085	110 (10.1)	57 (51.8)	5 (4.5)	1 (0.9)	30 (27.3)	74 (67.3)
40s	1,274	200 (15.7)	108 (54.0)	19 (9.5)	8 (4.0)	44 (22.0)	129 (64.5)
50s–	835	136 (16.3)	89 (65.4)	24 (17.6)	10 (7.4)	37 (27.2)	65 (47.8)
<b>Women</b>							
–30s	260	6 (2.3)	1 (16.7)	0 (0.0)	0 (0.0)	1 (16.7)	5 (83.3)
40s	318	34 (10.7)	20 (58.8)	4 (11.8)	0 (0.0)	7 (20.6)	23 (67.6)
50s–	205	59 (28.8)	37 (62.7)	11 (18.6)	6 (10.2)	14 (23.7)	28 (47.5)

<sup>a</sup>Total cholesterol >240 mg/dL or subjects taking medication (classification based on baseline examination data of year 1999–2000).

<sup>b</sup>Results from a questionnaire survey of the following year, 2000–2001. <sup>c</sup>“Subjects not aware of hypercholesterolemia” or “neglected (not taking medication and not receiving lifestyle treatment).”

## Discussion

We performed an analysis of the prevalence of hypertension and hypercholesterolemia, as well of the awareness level and treatment status for these diseases (*i.e.*, medication and lifestyle modifications) in Japanese workers. The awareness rate of hypertension was significantly higher than that of hypercholesterolemia in subjects aged 40 years and older. Furthermore, the percentage of untreated subjects with hypertension was significantly lower than that of untreated subjects with hypercholesterolemia.

There may be some explanations for the difference in the awareness levels between hypertension and hypercholesterolemia. First, since the results of blood pressure measurement are known immediately upon examination, subjects were notified of high blood pressure at the examination site. In contrast, the blood tests for hypercholesterolemia required several weeks, and thus subjects with this condition were notified nearly a month later. This time lag may be one of the reasons for the difference in the awareness levels between the two risk factors. Second, there is widespread use of simple automatic blood pressure monitors in Japan, and blood pressure measurements can be performed easily at home. Furthermore, since strokes have been the leading cause of death in Japan from 1951 to 1980 (2, 18), preventative efforts in cardiovascular diseases have focused more on hypertension than hypercholesterolemia. The awareness level might be affected by the high interest level in hypertension in the general public.

There are many reports from Europe and the U.S. on the awareness and treatment of hypertension and hypercholesterolemia. The awareness rate of hypertension among the gen-

eral population is approximately 1/2 to 2/3 in developed countries (10). In the National Health and Nutrition Examination Survey (NHANES), a representative study of hypertension and hypercholesterolemia awareness was conducted during 1999–2000, the same time period as our study (9, 11). Although the method of the assessment of awareness differed from that in our study, the awareness rate among hypertensive subjects in their study was 73.3% in 40–59-year-olds, similar to the results of our study. In contrast, the awareness rates of hypercholesterolemia was 39.4% in 20–44-year-olds and 70.2% in 45–64-year-olds, which suggested that the younger age group in Japan has a slightly higher awareness rate than in the U.S. However, the awareness rate was higher in the older age group in the NHANES than in our study.

These results may be due to the lack of a continuous national campaign against hypercholesterolemia in Japan, which may be due to the lower incidence of ischemic heart disease in Japan than in Europe and the U.S. (3). However, there are reports of the incidence of ischemic heart disease tending to increase in urban areas from a long-term perspective (19, 20). Therefore, health promotion to increase the awareness of hypercholesterolemia is considered necessary. In the present study, the awareness rates of hypertension and hypercholesterolemia and untreated rates were inversely correlated. The first step towards controlling these diseases is considered to be knowledge of one's own pathological conditions. However, to reveal the association between awareness and initiation of treatment, an intervention study for awareness will be needed.

To the best of our knowledge, there are only a few reports on the awareness of hypercholesterolemia and hypertension in Japan. Asai *et al.* used the data from the Jichi Medical



**Table 4. Comparisons of Awareness and Treatments Rates in Subjects with Positive Findings of Hypertension and Hypercholesterolemia**

	Number of subjects with positive findings ( <i>n</i> )	Have awareness ( <i>n</i> (%))	<i>p</i> -value <sup>a</sup>	Untreated subjects <sup>b</sup> ( <i>n</i> (%))	<i>p</i> -value <sup>a</sup>
≤39 years-old					
Men					
Hypertension	244	120 (49.2)	0.830	180 (73.8)	0.397
Hypercholesterolemia	125	60 (48.0)		87 (69.6)	
Women					
Hypertension	15	10 (66.7)	0.038	10 (66.7)	0.445
Hypercholesterolemia	6	1 (16.7)		5 (83.3)	
Total of men and women					
Hypertension	259	130 (50.2)	0.498	190 (73.4)	0.514
Hypercholesterolemia	131	61 (46.6)		92 (70.2)	
≥40 years-old					
Men					
Hypertension	427	321 (75.2)	<0.001	176 (41.2)	<0.001
Hypercholesterolemia	336	197 (58.6)		194 (57.7)	
Women					
Hypertension	73	54 (74.0)	0.085	29 (39.7)	0.053
Hypercholesterolemia	93	57 (61.3)		51 (54.8)	
Total of men and women					
Hypertension	500	375 (75.0)	<0.001	205 (41.0)	<0.001
Hypercholesterolemia	429	254 (59.2)		245 (57.1)	

<sup>a</sup> $\chi^2$  test. <sup>b</sup>Definition of “untreated” include “subjects not aware of hypertension (or hypercholesterolemia)” or “neglected (not taking medication and not receiving lifestyle treatment).”

School (JMS) cohort study, in which the subjects were taken from the general population in the community. That study was a survey of self-awareness of hypertension conducted from 1992 to 1995 (12). The awareness among hypertensive subjects in that study was lower than in our study. In that study, awareness was 24% for men and 28% for women in their 40s, and 36% for men and 48% for women in their 50s. The possible reasons for such differences between the studies are as follows. The JMS cohort study defined subjects as having an awareness of hypertension when they were “told to have hypertension by a physician.” In the present study, the awareness of hypertensive was examined in the year following the year in which blood pressure was measured. Furthermore, when Asai *et al.* conducted the study between 1992 and 1995, the general criteria for hypertension was an SBP≥160 mmHg or a DBP≥95 mmHg. Therefore, it is possible that the percentage of individuals who were told they had hypertension by their physicians or other medical professionals was different than the percentage of individuals notified of hypertension in the present study.

Lifestyle modification is useful in reducing total cholesterol levels (21). However, there are many untreated subjects with hypercholesterolemia who are not taking medication and not undergoing lifestyle modification. To receive appropriate guidance for lifestyle modification, individuals with positive findings for hypercholesterolemia must first be aware that

they have this risk factor. Furthermore, it is important to disseminate information about the usefulness of lifestyle modification to individuals with hypercholesterolemia.

There were a few limitations in the present study. First, the subjects of our study were workers who may have been subject to the “healthy worker effect.” That is, the surveyed population may have been healthier than the general population in the respective community. In addition, the subjects in our study were all from large-scale workplaces with 50 employees or more. By the Industrial Safety and Health Law in Japan, a workplace with 50 employees or more is obligated to have an appointed employment medical advisor. All the workplaces targeted in our study had an employment medical advisor involved in health management. However, in Japan there are many small companies with less than 50 employees. Thus our results may not apply to all workplaces in Japan, especially in small companies.

In conclusion, our results indicate that there are still many unaware and untreated subjects with hypertension and hypercholesterolemia, even among employees in large companies. It is important to increase the awareness of these risk factors in individuals with positive findings. Furthermore, it is important to improve their lifestyles and start medication early enough to reduce the morbidity and mortality of diseases associated with these risk factors. For this purpose, it is necessary to promote interventions of not only individuals with

positive findings but also their surrounding people and environment, a so-called “population strategy.”

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## Appendix

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### Appendix Table

“Has a physician or nurse ever told you that you have the following diseases? Please circle all the diseases that apply.”

#### Hypertension

1. I have never been told that I have it.
2. I have been told that I have it but I have not done anything special.
3. I am receiving follow-up examinations (no medication).
4. I have been advised to take medication but I have not taken any.
5. I have been treated previously.
6. I am presently taking medication.

For people who have been told that they have high blood pressure:

Please circle all lifestyle treatments that you are undergoing.

1. I am not doing anything special.
2. I am undergoing dietary treatment.
3. I am undergoing exercise treatment.
4. I am getting anti-obesity care.
5. I am reducing my alcohol intake.

#### Hypercholesterolemia

1. I have never been told that I have it.
2. I have been told that I have it but I have not done anything special.
3. I am receiving follow-up examinations (no medication).
4. I have been advised to take medication but I have not taken any.
5. I have been treated previously.
6. I am presently taking medication.

For people who have been told that they have high cholesterol: Please circle all lifestyle treatments that you are undergoing.

1. I am not doing anything special.
2. I am undergoing dietary treatment.
3. I am undergoing exercise treatment.
4. I am getting anti-obesity care.
5. I am reducing my alcohol intake.

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