JHS manuscript proposal content

## Context

Guidelines recommend using blood pressure (BP) and cardiovascular disease (CVD) risk to guide the decision to initiate antihypertensive medication. In the 2017 ACC/AHA BP guideline, adults with stage 1 hypertension and 10-year atherosclerotic CVD risk ≥ 10% were recommended to initiate antihypertensive medication. The AHA recently introduced equations for estimating 30-year risk of total CVD for adults 30 to 60 years of age. In a recent NHANES paper, we estimated the mean 30-year total CVD risk was high among adults 30 to <60 years of age with stage 1 hypertension and 10-year total CVD risk <10%. It is unclear whether adults without hypertension with low 10-year predicted total CVD risk but high 30-year predicted total CVD risk should initiate antihypertensive medication. We hypothesize that the incidence of hypertension will be higher among black adults with higher 30-year predicted total CVD risk and that there will be evidence of sub-clinical CVD among adults with high 30-year predicted total CVD risk when they develop hypertension. This may provide information on the decision to initiate antihypertensive medication among adults with high 30-year predicted total CVD risk before they develop hypertension.

## Aims

1. Describe the distribution of 10-year and 30-year total cardiovascular disease risk among adults without hypertension. These distributions will be estimated for all adults without hypertension and for those with normal BP, elevated BP and stage 1 hypertension.
2. Estimate the association between 30-year total CVD risk and incident hypertension.
3. Estimate the association between 30-year total CVD risk and incident cardiovascular disease.
   1. Estimate the incidence of CVD between visit 1 and visit 3.
   2. Among participants who did not develop CVD between visit 1 and visit 3, estimate left-ventricular mass index (LVMI) and the prevalence of sub-clinical CVD based on left-ventricular hypertrophy (LVH) at visit 3 among those who did and did not develop hypertension
   3. Compare left-ventricular mass index (LVMI) and LVH among people who developed and did not develop hypertension.

## Questions and options

Should we look at albuminuria (ACR)?

Do we need to consider LVMI and LVH at Visit 1? Should we just focus on this at a follow-up assessment?

We have the option of including additional cohorts:

1. Use JHS only (JHS has Echo @ V1 and MRI @ V3). we may have sufficient sample size in JHS (see overall column below and for those with stage 1 hypertension)
2. Use JHS + REGARDS (JHS has ECG @ V1 and V3, REGARDS has ECG @ V1 and V2)
3. Use JHS + CARDIA (CARDIA has Echo @ Y5, Y25 and Y30)

Table 1: Jackson Heart Study participants included in the current analysis.

| **Inclusion criteria** | **No. of participants** |
| --- | --- |
| JHS participants | 5,306 |
| Age 30 to < 60 years at visit 1 | 3,067 |
| Consented to CVD follow-up at visit 1 | 2,953 |
| No history of CVD at visit 1 | 2,943 |
| Have information on self-reported antihypertensive medication use and blood pressure at visit 1 | 2,882 |
| Have information on other variables in the PCEs and PREVENT equations at visit 1 | 2,608 |
| All variables in range for PREVENT equations at visit 1 | 2,489 |
| Without hypertension at visit 1 | 1,388 |
| With hypertension status known at visit 2 or visit 3 | 1,230 |

Table 2: Number of Jackson Heart Study participants in groups defined by blood pressure and total cardiovascular disease risk.

| **PREVENT CVD risk equation** | **Overall (n = 1,230)** | **Elevated blood pressure (n = 225)** | **Normal blood pressure (n = 613)** | **Stage 1 hypertension (n = 392)** |
| --- | --- | --- | --- | --- |
| 10-year total CVD risk | | | | |
| < 10% | 1,215 | 221 | 611 | 383 |
| ≥ 10% | 15 | 4 | 2 | 9 |
| 30-year total CVD risk | | | | |
| <10% | 457 | 58 | 316 | 83 |
| 10% to <15% | 288 | 60 | 141 | 87 |
| 15% to <20% | 207 | 50 | 72 | 85 |
| 20% to <25% | 155 | 28 | 61 | 66 |
| 25% to <30% | 69 | 16 | 13 | 40 |
| ≥30% | 54 | 13 | 10 | 31 |
| 30-year total CVD risk among those with 10- year total CVD risk <10% | | | | |
| <10% | 457 | 58 | 316 | 83 |
| 10% to <15% | 288 | 60 | 141 | 87 |
| 15% to <20% | 207 | 50 | 72 | 85 |
| 20% to <25% | 155 | 28 | 61 | 66 |
| 25% to <30% | 69 | 16 | 13 | 40 |
| ≥30% | 39 | 9 | 8 | 22 |