

## **Cognitive Interview Evaluation of the BPQ questionnaire for 2007-2008**

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This report documents results of cognitive testing of a module of questions related to hypertension and pre-hypertension proposed for the National Health and Nutrition Examination Survey. Cognitive interviews were conducted by four members of the Questionnaire Design Research Laboratory (QDRL) staff on July 10<sup>th</sup> and July 14<sup>th</sup>, 2006. A semi-scripted, retrospective probing protocol was used for this study, meaning that interviewers initially administered the questionnaire to participants in its entirety. Following that, interviewers asked follow-up probe questions to explore participant interpretations of the questions and details about the meaning of their responses. The interviewing team discussed general probing strategies prior to data collection, but interviewers retained discretion regarding which specific probes to use and how much probing to do, based on particulars of each interview.

QDRL participants are most commonly recruited through advertisements and scheduled for interviewing appointments at NCHS. Because this questionnaire is quite brief, we were reluctant to ask participants to travel to NCHS and therefore adopted an alternative strategy: setting up a poster with some study details at a local library. Interested and eligible individuals could sign-up to participate that day, usually right away. This procedure captured people in the course of their daily activities and was much less time consuming for them. In total, we interviewed twenty-four people for this study. Interviews lasted between 10 and 30 minutes, and all participants were paid \$20 for their time and effort.

The only specific recruitment criterion was that participants needed to be at least 45 years of age. We expected that this threshold would give us a reasonable chance of recruiting individuals with various levels of hypertension. We did not want to recruit explicitly on the basis of hypertension status, or even to mention hypertension as the primary topic of the questionnaire, so that they would approach the questions without giving the topic any advance thought (as would be the case in the actual survey).

Participants ranged in age from 45 to 85, with a median age of 55. Fourteen identified themselves as White, eight as Black, one as Asian and one as American Indian. Education levels ranged from 10<sup>th</sup> grade to graduate degrees, with median level being one year of post-high school education. Eight were married, four divorced, three widowed, and nine had never been married.

Participants' hypertension statuses could be grouped into four categories:

- Eleven participants did not have hypertension, pre-hypertension, or any elevated blood pressure as far as they knew. Many had limited knowledge about their blood pressure readings, remembering only that a doctor had told them "it's fine"

or something along those lines. However, they generally answered all questions easily and expressed confidence in the veracity of their responses.

- Four participants had some degree of pre-hypertension, but not full-blown high blood pressure. Their situations and responses tended to be more complex—see comments following questions New2 and New3 for more details.
- Seven participants had been told that they had hypertension, but not pre-hypertension. In most cases, the onset of their high blood pressure had seemed sudden to them. They generally took daily medication and were aware of their recent blood pressure readings.
- Two participants had hypertension, but had also been told at some earlier point that they had pre-hypertension.

Specific question by question results are presented below. A brief summary of recommendations appears at the end of the report.

BPQ.020 {Have you/Has SP} **ever** been told by a doctor or other health professional that {you/s/he} had hypertension, also called high blood pressure?

YES .....1  
NO .....2 (BPQ.New2)  
REFUSED ..... 7 (BPQ.New2)  
DON'T KNOW .....9 (BPQ.New2)

**INTERVIEWER INSTRUCTION:** If SP says “high normal blood pressure”, “borderline hypertension” or “prehypertension” then code as a No and CONTINUE with **BPQ.New2**.

Fourteen participants initially answered no to this question. Many of these participants remembered being told “your blood pressure’s fine” but did not remember specific blood pressure readings (in fact, some indicated that they were never told what their actual readings were). Others reported approximations (“I think it’s 120 over something”) but only a few reported specific readings. Still, most expressed strong confidence in their responses, and probing did not usually uncover any reason to doubt them.

Of the fourteen participants who answered “no,” two described situations that were somewhat ambiguous. One participant was told by a doctor at a health fair that his blood pressure was “high” (about 140/85) and advised him to check with his usual physician. However, the participant dismissed this reading as being driven by contextual factors such as recent weight gain. If the question was answered literally, this probably should have counted as a “yes,” based on both the actual reading and the doctor’s diagnosis. Another participant had a recent blood pressure reading of 148/90 at a doctor’s office, but the doctor told her that he did not consider that to be high given her age and other factors. Thus, “no” responses might sometimes include situations where participants received

high blood pressure readings but either they or their doctors did not believe them to be significant (for whatever reason).

Ten participants initially answered yes to this question. All were receiving some sort of medical care related to hypertension and were being monitored by a physician. Their actual blood pressures varied, with systolic readings around 185+ to as low as 145.

One of the participants who initially answered yes changed his answer to “no” upon hearing question New2. At that point, he indicated that the doctor had actually told him that he had pre-hypertension. When answering BPQ.020, he did not know that a subsequent question would make a distinction between hypertension and pre-hypertension. He assumed that this question was the only opportunity he would have to report any degree of problem with blood pressure. This situation was easily discovered when New2 was asked. It seems likely that this question could capture false positive responses with respondents in similar circumstances. That might not be a serious problem, if the distinction between conditions is properly made through later questions. However, an alternative approach would be to ask a global question first (e.g., “have you ever been told by a doctor or other health professional that you have hypertension, also called high pressure, or borderline hypertension?”) using later questions to distinguish which applied. Another option would be to cue respondents up front that both conditions will be discussed, e.g.: “The next few questions are about your blood pressure. First I am going to ask you questions about hypertension, also known as high blood pressure, and then I am going to ask about borderline hypertension.” The exact wording might require some work and such a question should be tested, if this route is followed.

Interestingly, at least one participant was confused about the meaning of “hypertension.” He thought that hypertension referred to people who were fidgety and stressed-out. In his mind these traits were probably related to high blood pressure (“they go hand in hand”) but were not necessarily identical. His answer to the question still appeared to be accurate. However, the term “high blood pressure” was more colloquially familiar and widely understood than “hypertension.” If such potential misinterpretations are of concern, the question could place more emphasis on “high blood pressure” than hypertension (i.e., “... told that you had high blood pressure, also known as hypertension?”)

BPQ.030 {Were you/Was SP} told on 2 or more **different** visits that {you/s/he} had hypertension, also called high blood pressure?

YES .....	1
NO .....	2
REFUSED .....	7
DON'T KNOW .....	9

Ten participants answered this question, eight of whom answered “yes.” In some cases, these responses meant that participants had been diagnosed at least two times prior to

receiving any treatment; in others the participants were put on medication after an initial visit. They were not always sure how many times they had been literally told “you have hypertension” but did not seem to think that this was an important distinction. Generally, participants answered yes if they were being treated for the condition.

There was one exception: one participant was told that his blood pressure had abruptly become high several years ago. He immediately started medication, and in his mind was only told once. It is possible that respondents who take medication could interpret the question as referring only to times “before you started medication”—and thus, respondents in similar conditions would provide different answers.

Also, one participant had trouble understanding the question and asked for it to be repeated several times before answering “yes.” Although she could understand the literal words of the question, she wasn’t sure how to answer because she could not understand the intent of the question. At a certain point in the discussion she realized that being told about high blood pressure more than once might give the diagnosis more significance—then the question made sense to her.

We assume that the purpose of this question is to distinguish respondents with only transient high blood pressure readings from those with longer-term hypertension. If so, potential ambiguity and confusion could be reduced by skipping out respondents who reported that they had been told to take prescribed medicines (and obviously, this would require moving this item several questions ahead).

Also of note—one additional participant initially answered no, but this was the participant who erroneously answered “yes” to BPQ.020. He had only been told that he had pre-hypertension one time.

**BPQ** How old {was SP/were you} when you **first** told {you/him/her} that {you/he/she} had  
**New1:** hypertension or high blood pressure?

\_\_\_\_|\_\_\_\_|  
ENTER AGE IN YEARS

LESS THAN 1 YEAR.....666  
REFUSED .....777  
DON'T KNOW .....999

All participants who received this question were able to provide specific ages for their answers (although a few provided a two-year age range). Three participants had first been told they had hypertension within the last year, and they found it easy to answer. Three other participants had been told about hypertension longer ago (between 11 and 27 years ago), but remembered something specific about the date or age (e.g., it was the same year as a pregnancy, the same age that her mother was diagnosed, the actual year it happened was memorable for some reason). Consequently, all participants were very

confident of their responses. The remaining four participants gave estimates, but were confident that they were accurate within a few years. Two of these participants had difficulty remembering exact years because they had several medical diagnoses that were difficult to keep straight.

Such a range of recall strategies are commonly employed by respondents in answering this type of question. We did not find any noteworthy problems with this item.

BPQ.040a Because of {your/SP's} (high blood pressure/hypertension), {have you/has s/he} **ever** been told to **take prescribed medicine**?

YES .....1  
NO .....2 (BPQ.New2)  
REFUSED .....7 (BPQ.New2)  
DON'T KNOW .....9 (BPQ.New2)

All ten participants who received this question answered it affirmatively. Only one participant had trouble understanding the question—apparently she was confused by the passive voice. A possible revision would be to ask “because of your high blood pressure, has a doctor ever told (you/SP) to take prescribed medicine?” (However, we note that the entire questionnaire is in passive voice. There is something to be said for consistency, and the current structure of questions has the advantage of making it immediately clear whether the question is about the respondent or another sample person.)

The participant who had pre-hypertension received this question incorrectly, but still answered yes. Probing revealed that he was reporting some sort of “mild sedative” to keep him calm, as opposed to a medication specifically for high blood pressure. It appeared that all other participants were taking medication specifically for blood pressure. It is possible that respondents could report medications that were indirectly related to high blood pressure (e.g., designed to help with stress or some other underlying condition or related condition, having the effect of lowering blood pressure even if this was not the primary purpose of the medication). However, aside from the one case mentioned above, we did not seem to collect such responses in this study.

BPQ.050a {Are you/Is SP} **now** taking a prescribed medicine?

YES ..... 1  
NO ..... 2  
REFUSED ..... 7  
DON'T KNOW ..... 9

All participants who received this question answered yes—all currently take medication on a regular schedule. There did not appear to be any problems or notable issues with this question.

**BPQ New2:** {Have you/Has SP} **ever** been told by a doctor or other health professional that {you have/SP has} prehypertension?

CAPI INSTRUCTION:

HELP SCREEN: **prehypertension** is defined as having a blood pressure reading of 120 to 139 for the first reading and the second reading of 80 to 89 millimeters.

YES .....	1
NO .....	2
REFUSED .....	7
DON'T KNOW .....	9

General note: We administered this question to all participants, regardless of their response to the hypertension question (BPQ.020), as seems appropriate based on skip instructions. Even if this was not as intended, we thought it would be useful to see how participants with hypertension answered.

Of the ten who reported having hypertension at BPQ.020, seven answered no to this question. They consistently reported that they had not heard the term “pre-hypertension” before (although most made reasonable assumptions about what it meant, along the lines of blood pressure being “not that bad yet”). Their answers appeared to be accurate—probing revealed that they had been diagnosed with hypertension without advance warning.

Of the ten who reported having hypertension at BPQ.020, the remaining three participants answered yes to this question. One thought that it was more accurately described as “borderline high,” although she did not hesitate to answer yes. Another participant assumed the answer was yes, but was uncertain that this specific term had been used. About 15 years ago she was told that her blood pressure was “a little high”; a year later, after gaining additional weight, she had been diagnosed with full-blown hypertension. Although she answered with mild uncertainty (“it seems like maybe yes”), she thought the term applied to what she experienced. The third participant was initially confused by this question, but then realized that he had actually been diagnosed with pre-hypertension all along, not hypertension as he had originally reported.

Of the fourteen participants who reported that they had NOT ever had hypertension at BPQ.020, only one participant initially answered yes to this question. She was only told that she had pre-hypertension after commenting to her physician that her blood pressure sounded a little bit high. The physician confirmed that her reading was pre-hypertensive. As a result of that, she purchased a blood pressure monitor at home and never had another high reading. She thought the one pre-hypertensive reading at the doctor’s office was most likely due to stress.

The remaining participants all answered no. Generally these participants said that their blood pressure was “fine” and did not give the question much more thought than that.

Most indicated that they had not heard the term pre-hypertension before, but assumed it meant something like “higher than normal but not as bad as having ‘high blood pressure.’” Nevertheless, two of these participants had recent blood pressure readings that were high enough to warrant “yes” responses. One participant simply did not remember this fact until probing at the end of the questionnaire (as described more fully in comments to New3, below). However, since she remembered that her blood pressure had been called “high but normal,” she might not have answered yes to this question even if she had remembered this event (i.e., the term “pre-hypertension” had never been used). Another participant had been told by her doctor that her blood pressure of 148/90 should be monitored, but was not troubling at her age. While she answered yes to the following question (New3), her interpretations of key terms were a little confusing. Although she had never heard the specific term “pre-hypertension” before, she thought that “hypertension” had a broader meaning than simply “high blood pressure”—i.e., it described an underlying condition responsible for problems such as high cholesterol as well. So, while her answer may have been literally correct (her doctor had not used the term “pre-hypertension” in explaining her condition), her interpretation of the question was also off-target.

Interestingly, some misunderstandings recurred that had been described earlier in this report: at least two participants explained their answers in terms of hyperactivity rather than hypertension. For example, one participant said “I’m not hyper, I’m introverted... I’d rather have a beer in the morning than coffee.” Another explained that he was cool and “not fidgety.” Their responses to the question appeared to be correct in spite of the misunderstanding (i.e., probing did not reveal any evidence that they had been diagnosed with hypertension or pre-hypertension). However, these misunderstandings (coupled with the similar misunderstanding of a participant as described following BPQ.020) do suggest the potential for people to answer based on an incorrect understanding of the term. It may be useful to emphasize the more colloquial high blood pressure over hypertension within these questions whenever feasible.

At least one participant did not understand the difference between systolic and diastolic blood pressure. Consequently, when hearing the definition, he thought that pre-hypertension meant a fluctuating “single-value” blood pressure between 80 and 139 on different occasions. This misunderstanding might be avoidable by modifying the definition slightly (e.g., “Every blood pressure reading includes two numbers—one number while the heart is beating and another number while the heart is resting. In high normal blood pressure...”)

**BPQ New3:** {Have you/Has SP} ever been told by a doctor or other health professional that {you have/SP has} high normal blood pressure or borderline hypertension?

- YES ..... 1
- NO ..... 2
- REFUSED ..... 7
- DON'T KNOW ..... 9

High normal blood pressure  
Borderline hypertension

CAPI INSTRUCTION:

HELP SCREEN: **High normal blood pressure or borderline hypertension** is defined as having a blood pressure reading of 120 to 139 for the first reading and the second reading of 80 to 89 millimeters. People with blood pressures that are high normal blood pressure or borderline hypertension also called **prehypertension**.

We noted that “New3” is very similar to “New2,” but administered both questions to all participants, as we believe was intended.

In most cases, participants provided the same answer that they had to the previous question. However, there were several exceptions:

- One participant answered no to New2 but yes to New3. Her doctor had told her that her blood pressure reading of 148/90 was not too bad for her age (51) and that they would just monitor it for now. She answered yes to New3 because she interpreted “high normal” as referring to readings that might be high in an absolute sense but were “normal for her.” To her, this lined up with what her doctor told her. In contrast, she thought that “pre-hypertension” (New2) sounded like the beginning of a health problem. The doctor had not told her that, and she did not think it applied either.
- Another participant also answered no to New2 and yes to New3. Here also, the reason for the discrepancy centered on the term “high normal.” She actually had full-blown hypertension, but interpreted “high normal” as referring to high blood pressure that is controlled by medication. Thus, her response to New3 is apparently a false positive.
- One participant answered yes to New2 and no to New3. His doctor had told him that he had pre-hypertension, but he seemed to be confused by New3, saying “no...it’s always been normal until this year, never above or below.” Further analysis suggested that he was confused by the similarities of New2 and New3. Having already reported that he had pre-hypertension, he over-analyzed the latter question, thinking that it must be asking something different.

Disagreement between these two questions does not necessarily indicate that one response is “wrong,” as doctors may use one term (“high normal blood pressure”) and not another (“pre-hypertension”). However, several participants expressed confusion as to why we were asking two virtually identical questions. It is a common phenomenon for respondents to assume that there is an important distinction between the questions even when there really is not—they presume it would not make sense for us to ask two questions about the same thing. As a result, respondents may over-analyze the meaning of the questions and provide inconsistent answers.

We found that several other participants misunderstood the term “high normal” blood pressure, thinking that it meant either “controlled high blood pressure” or “blood pressure that is high, but normal for me.” Generally this did not affect the accuracy of their answers, as they either had full-blown hypertension or no problems with blood pressure at all. However, the potential for misunderstanding should be carefully considered.

One other situation was worth reporting: one participant answered no to both New2 and New3, but later, when responding to probes, recalled that the doctor had recently called her blood pressure “normal but high.” She then indicated that her response to New3 should have been yes. The interviewer asked her if there was something about the question that was unclear or failed to help her remember that. She replied that the question was fine and attributed her slip to changing blood pressure standards. Her blood pressure has not changed much in recent years, but she claimed that what used to be considered “normal” is now considered “borderline.” Thus in her mind, her blood pressure has not gone up and she does not have anything abnormal to report with regard to blood pressure. This may have simply been a quirky situation; it’s not clear that this situation could have easily been averted through a change in question wording.

As written, we did not think that the hand card was necessary—in fact, it seemed to take more effort to present it than was justified. However, if the questions are consolidated into one question (see below), a hand card might be helpful.

Taking all of the issues above into consideration, it might be preferable to ask one question about pre-hypertension rather than two. A brief introductory statement might also help to define what we are talking about and make it clear that one medical situation might be referred to by several different names. One possible wording could be:

Some people have blood pressure that is only a little higher than normal. This condition may be called pre-hypertension, borderline hypertension, or high normal blood pressure. (Show card). Have you ever been told by a doctor or health professional ever told you that you have any of these?

[Retain Help Screen definition as before]

If two questions are kept on this instrument, it might be useful to skip the second question about borderline/pre-hypertension if respondents answer “yes” to the first—that is, accept an affirmative answer to either question as an indicator of pre-hypertension. Doing so could help to avoid some confusion. There might also be some advantage to asking New3 first, as the term “blood pressure” is more colloquial and widely understood than hypertension.

### Summary of recommendations:

- Emphasize “high blood pressure” over “hypertension” whenever possible, because the former term is more readily understood. For example, there could be advantages to saying “...that you had high blood pressure, also called hypertension” rather than the other way around.
- Consider a general introduction explaining that the following questions will address hypertension and pre-hypertension. This should help to prevent premature reporting of pre-hypertension. Alternatively, ask a screening question about both hypertension and pre-hypertension, using subsequent questions to differentiate which condition the respondent had.
- Ask New1 immediately following BPQ.020. Consider moving BPQ.030 after BPQ.050a, and only administer it to respondents who are not taking medication for high blood pressure.
- Consider the use of active voice for questions, which tends to be easier to understand. If this is not feasible or desirable throughout, consider rewording BPQ.040a to “Has a doctor or other health professional ever told [you/SP] to take a prescribed medication for your high blood pressure?”
- Begin the “help screen” comment for New2 and New3 with an additional explanation: “Every blood pressure reading includes two numbers—one number while the heart is beating and another number while the heart is resting.”
- Consider combining New2 and New3 into a single question. If both questions are kept, only ask the second question if the first response is negative, and consider reversing the order in which they are presented.

## BPQ questionnaire for 2007-2008

BPQ.020 {Have you/Has SP} **ever** been told by a doctor or other health professional that {you/s/he} had hypertension, also called high blood pressure?

YES ..... 1  
NO ..... 2 (BPQ.New2)  
REFUSED ..... 7 (BPQ.New2)  
DON'T KNOW ..... 9 (BPQ.New2)

**INTERVIEWER INSTRUCTION:** If SP says “high normal blood pressure”, “borderline hypertension” or “prehypertension” then code as a No and CONTINUE with **BPQ.New2**.

BPQ.030 {Were you/Was SP} told on 2 or more **different** visits that {you/s/he} had hypertension, also called high blood pressure?

YES ..... 1  
NO ..... 2  
REFUSED ..... 7  
DON'T KNOW ..... 9

**BPQ New1:** How old {was SP/were you} when you **first** told {you/him/her} that {you/he/she} had hypertension or high blood pressure?

\_\_\_\_\_  
ENTER AGE IN YEARS

LESS THAN 1 YEAR ..... 666  
REFUSED ..... 777  
DON'T KNOW ..... 999

BPQ.040a Because of {your/SP's} (high blood pressure/hypertension), {have you/has s/he} **ever** been told to **take prescribed medicine**?

YES ..... 1  
NO ..... 2 (BPQ.New2)  
REFUSED ..... 7 (BPQ.New2)  
DON'T KNOW ..... 9 (BPQ.New2)

BPQ.050a {Are you/Is SP} **now** taking a prescribed medicine?

YES ..... 1  
NO ..... 2  
REFUSED ..... 7

DON'T KNOW ..... 9

**BPQ New2:** {Have you/Has SP} **ever** been told by a doctor or other health professional that {you have/SP has} prehypertension?

CAPI INSTRUCTION:

HELP SCREEN: **prehypertension** is defined as having a blood pressure reading of 120 to 139 for the first reading and the second reading of 80 to 89 millimeters.

YES ..... 1  
NO ..... 2  
REFUSED ..... 7  
DON'T KNOW ..... 9

**BPQ New3:** {Have you/Has SP} ever been told by a doctor or other health professional that {you have/SP has} high normal blood pressure or borderline hypertension?

YES ..... 1  
NO ..... 2  
REFUSED ..... 7  
DON'T KNOW ..... 9

HAND CARD **BPQ New3**

High normal blood pressure  
Borderline hypertension

CAPI INSTRUCTION:

HELP SCREEN: **High normal blood pressure or borderline hypertension** is defined as having a blood pressure reading of 120 to 139 for the first reading and the second reading of 80 to 89 millimeters. People with blood pressures that are high normal blood pressure or borderline hypertension also called **prehypertension**.

HAND CARD BPQ New3

High normal blood pressure

Borderline hypertension