

**Adult Core Respiratory Disease Questionnaire  
Including Occupational Components  
Cognitive Testing Results**

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This report summarizes the findings from a cognitive interview evaluation of questions proposed for the National Institute for Occupational Safety and Health's (NIOSH) Adult Core Respiratory Disease Questionnaire. The evaluation was conducted by the Questionnaire Design Research Laboratory (QDRL) staff at the National Center for Health Statistics (NCHS) in Hyattsville, Maryland.

**Methods**

Interviews were conducted in the laboratory at NCHS and in several nearby communities in 2006 and 2007. All interviews were conducted one on one by QDRL staff members who are trained in the methods for conducting cognitive interviews to evaluate survey questions. Five different interviewers participated in this project. All interviews were either audio-taped or video-taped so that QDRL staff could review the interviews as needed for analysis. The interviews were approximately 60 minutes in length.

An interviewing protocol was drafted by the QDRL staff prior to the beginning of interviewing for this project. This interviewing protocol consisted of the questions in the Adult Core Respiratory Disease Questionnaire along with some suggested probes that were added by QDRL staff. Probes are questions that are designed to elicit explanations about a participant's answer directly from the participant. Some examples of these probes include questions such as "What were you thinking about when you answered that question?" or "How did you come up with your answer?" The participant's responses to these probes allow the QDRL to evaluate how well the questions are working.

Interviewers read each question as written, obtained a response, and then administered probes relevant to the question. Sometimes, blocks of related questions were administered together before probing began so that probing would not interrupt the flow of questions. Interviewers were allowed to skip probes if they seemed redundant or inappropriate, and to add new probes to investigate unanticipated issues that emerged during the interview. Interviewers analyzed the interviews based on notes and review of recordings.

**Recruitment**

Based on discussions with NIOSH staff prior to interviewing, recruitment efforts focused on two groups of participants for this project. The first group consisted of those who had

respiratory problems or diseases such as bronchitis, pneumonia, emphysema, COPD, sleep apnea, IPF, or any chronic respiratory symptoms. The second group consisted of those who worked in a construction site, factory, mine, or other dusty environment, regardless of whether they had any respiratory problems. Participants were recruited primarily through newspaper advertisements. In later rounds, professional contacts were used to help identify eligible participants with experience in dusty trades.

Table 1 summarizes the demographics of the cognitive interview participants. Males made up about three fourths half of the sample. Roughly half of the participants were between the ages of 41 and 50. The youngest participant was age 24 and the oldest participant was age 57. Most of the sample had less than fifteen years of education. Seventeen participants were black, eleven participants were white, one participant was Asian, and one participant’s racial background was White and Native American. One third of the participants were identified as having respiratory problems or diseases prior to being interviewed and two thirds of the participants were from dusty work environments.

**Table 1. Demographics of cognitive interview participants.**

Demographic	All	Dusty work environment	Respiratory problem or disease
<b>Sex</b>			
Male	23	20	3
Female	7	0	7
<b>Age</b>			
40 or under	4	3	1
41-45	7	4	3
46-50	9	6	3
Over 50	8	5	3
<b>Years of education</b>			
12 or less	9	5	4
13-14	14	10	4
15 or more	5	3	2
<b>Race</b>			
White	11	10	1
Black	17	9	8
Asian	1	0	1
More than 1 race	1	1	0

**Analysis**

A qualitative analysis was conducted following the interviews. The analysis focused on describing the meaning of the answers to each question, identifying and describing any problems that arose during the interview and offering any potential solutions to the problems that were discovered during the testing of the questions. Analysis was conducted on a couple of different levels. First, analyses focused on individual interviews. Summaries of interviews written by individual interviewers the interviews

they conducted served as the primary source of information for this initial set of analyses. These interviewer summaries generally consist of descriptions of how participants answered the questions and any problems that occurred during the question-answer process. Next, systematic question-by-question analyses were conducted to identify themes or patterns that occurred across interviews. The interviewer summaries were consolidated for this part of the analysis. In addition, audio and video recordings of the interviews were used to review or supplement the information from the summaries.

Below, we present some general results from our testing of the work history questionnaire, and then follow with question by question comments on the Adult Core Respiratory Disease instrument. Sometimes questions were not administered to the full sample due to the length of the interview (limited to one hour), and skip patterns also reduced the number of participants who answered particular questions. As a result, some questions were tested infrequently and some not at all. We note sample sizes and indicate when questions were rarely or never tested in our comments below.

### **Work History Questionnaire Comments**

We alternately administered two versions of the work history questionnaire: one began with most recent job and then asked about each preceding job; the other asked about first job and asked about each subsequent one, ending in the present. About half of the participants received each version of the work history questionnaire. One of our objectives was to evaluate which approach worked better.

On the whole, we thought that *starting with the current job and working backwards* was a better approach. One key advantage to this approach is that it begins with the most memorable event, with subsequent reports building from there. Details about the first job were generally harder for participants to remember. Furthermore, it is not always clear which job to start with, as early full-time jobs tend to be of marginal relevance to one's ultimate career. For example, a couple of participants reported jobs that they held as store clerks as their first job, but most of their careers were spent in building trades. Also, starting with current job seemed to be easier for individuals with long work histories. On the whole, we observed many more response difficulties when the questionnaire began with first job than when it began with current job.

We also observed that it was common for some participants (particularly trade laborers) to group multiple jobs within a single report (e.g., "I was an insulator with Local 29.") Probing revealed that such reports often included multiple employers—for example, several participants were hired through a union by different companies. Individual jobs sometimes lasted a day, or in some cases years; participants might have worked for different companies on each job, or repeated some companies; it was also possible that they had multiple jobs (and therefore multiple employers) at the same time. Generally, participants did not break these jobs down further, and it would have been difficult for them to do so. Instead, they reported a general field of work, such as working as a "drywall finisher" for a certain number of years.

In some cases, such reports included considerable variety of job tasks as well. For example, one participant said that he had been in “pipeline construction work,” but probing revealed that he had been a laborer, foreman, supervisor and steward at various times under that general umbrella.

As a general strategy, it might be best to accept respondents’ interpretations of what constituted a “single job,” at least as an initial report. Based on the responses we observed, we suspect it would be difficult to solicit initial reports about specific individual jobs, or to impose a very detailed definition of “individual job” upon respondents. If it is desirable to obtain greater distinction between jobs, this might be accomplished through follow-up questions.

We also observed that a number of participants did not report jobs in a straight chronological fashion—some left gaps in their work history that needed to be filled in after the initial report. Some of these gaps seem to be due to estimation of years (that is, they did not always realize that they had left a gap); in some other cases, participants performed work that was somehow atypical of their career path, which probably made it less memorable. Follow-up probing may be required to explore any gaps that appear.

Another possibility worth considering is the use of a calendar as a memory and reporting aid. That is, participants would be asked to account for their job history at all points on a particular timeline. Such an approach might help to eliminate gaps and prompt memories, but it would also need to be tested in its own right.

Given the level of interaction that was required to obtain responses, the work history questionnaire would work best in a face-to-face interviewing mode. If a calendar approach used to facilitate data collection, face-to-face interviewing would probably be essential. We did not actually test the questionnaire using other modes, and cannot easily predict how well it would work in others (such as over the telephone). But on the whole, face to face interviewing, conducted in a somewhat less standardized manner than usual survey interviewing, seemed to facilitate data collection.

On the whole, the section was completed quickly and easily for those with short job histories. Predictably, it was more difficult and took more time for individuals with long job histories. Details from jobs held long ago were more difficult to recall than more recent ones.

Finally, a minor note: Item A asks whether respondents “are currently working in a full or part time job.” This is meant to be a yes/no question, but many participants thought it was an either/or question and answered “full time.” It might be simpler to ask whether respondents are currently “working in any paid job.”

## **Adult Core Questionnaire—Question by Question Comments**

### **6.a. Do you usually have a cough? Exclude clearing of throat.**

Thirteen participants answered yes and seventeen participants answered no to this question. Generally, “no” responses seemed to be on target with the objectives of the question. A number of participants explained that they only had coughs when they had a cold or some other illness. It was clear for these individuals that clearing of the throat and coughing due to short term illnesses were not included in their answer, as intended. Some of these participants contrasted themselves with others who do have persistent coughs, e.g. from smoking or other chronic problems. This question and the others in this section posed no problems for these individuals.

Most “yes” responses reflected clear problems with chronic coughs. Several participants who had been diagnosed with respiratory conditions reported nagging and persistent coughs, clearly consistent with the intent of the question. For example, one participant described a frequent, productive cough associated with asthma that was much more significant than clearing the throat.

However, “yes” responses also seemed to cover a broader range of circumstances than “no” responses, with some participants reporting marginal cases, in spite of the instructions. At least two participants primarily described coughs that cleared their throats. One of these participants was frequently exposed to dust while working on construction jobs. He described how he often voluntarily clears his throat of dust particles throughout the day. A second participant explained that her yes response was referring to a nervous habit to frequently clear her throat. This participant decided that her answer should be changed to no when she was probed about her initial answer.

Some other responses reflected relatively mild coughs, and there was sometimes a gray area regarding whether the cough was common enough to count as “usual.” For example, one participant reported a cough that was troubling when pollen was high, but not otherwise.

Suggestions: The symptom questions (especially the Q6 and Q7 series) pose a number of response challenges. These challenges are driven by (1) the lack of a reference period; (2) ambiguity surrounding the term “usually”; (3) complexity of the recall task in subsequent questions, as described later.

Adding a reference period (e.g. “in the past 12 months”) would be helpful. Although the lack of a reference period did not seem to cause explicit problems until the next question, it might help to encourage respondents to think about a particular time frame when answering all of them.

In this question and others, we believe that ambiguity about what it means to “usually” have a cough is partially responsible for some marginal situations to be reported as yes. Asking whether respondents cough on *most days throughout the last* [year/month/some

other time period] should be less ambiguous. If that is too far from the current wording, it might make sense to define “usually” in more explicit terms. Such instructions could specify a frequency threshold that should qualify as “usually.” They might also include clarifications regarding whether seasonal problems such as allergies should count.

This question has an additional issue in that it includes a “dangling” clause after the question mark. It is likely that the participants sometimes failed to consider these supplemental instructions. This could be one reason why several participants counted clearing of the throat in their responses. One way to work around this problem (based on the current question wording) would be to ask: “The next few questions are about coughs. Please do NOT include clearing of the throat. During [reference period] have you usually had a cough?”

**6.b. Do you usually cough as much as 4 times a day, 4 or more days out of the week?**

This question was applicable to the thirteen participants who reported that they usually have a cough. Twelve of these participants answered yes to this question, and one answered no.

Several participants indicated that they had considerable difficulty answering this question. One explained that she has a cough on some days but not others, and she does not pay much attention to how often she experiences a cough. A second participant also said that she coughs frequently, but when probed, indicated that she was uncertain about the specific frequency. Another participant who was frequently exposed to dust at work mentioned that he was not sure of his answer because he did not keep a log of his coughing—he initially answered “sometimes.” Responses to probes suggested that responses were often based upon general impressions rather than literal consideration of the question parameters.

These difficulties probably stem from several sources. First, the question asks respondents to keep track of and make judgments about multiple timeframes (four times per day, four or more days per week). In addition to that, it asks respondents to consider whether “usual” behavior meets this threshold. Furthermore, coughing events were not particularly salient for many individuals, making it difficult to judge whether a certain threshold is met.

Another problem is that the question does not include a reference period for the respondent to use when answering the question. This can be problematic when coughing symptoms vary over time. Two participants thought that the best answer for this question was “sometimes.” One of these participants, who had coughing problems associated with seasonal allergies, did not pay attention to the word “usually” in the question and initially answered yes. The participant eventually said that the best answer for this question and others in this section would have been “sometimes,” because her coughing patterns vary depending on her exposure to certain irritants.

Suggestion: One basic simplification would be to ask “On most days of the week, do you usually cough 4 or more times per day?” Although slightly less specific, we believe the wording will be functionally equivalent. Participants generally estimated rather than answering based on a literal accounting.

If the literal threshold of “four times a day, four or more days out of the week” is retained, consider asking multiple questions—for example: “Do you usually cough on 4 days or more out of the week? (If yes:) On those days that you cough, did you usually cough at least 4 times a day?” This adds some length to the questionnaire, but simplifies the response task as only one time period is posed per question.

As noted previously, it might also be useful to add a reference period to this question (and to the previous one) to define what time frame respondents should consider. “In the past month” would be short enough that it should not pick up changes across seasons. If this was adopted, however, an additional question might be needed to separate seasonal allergies from responses. As an alternative, consider an instruction that we are interested in coughs that have been on-going for a certain time frame (e.g., six months or longer).

In short, it would be useful to address problems of question complexity and ambiguous reference period. There are a number of ways this could be accomplished, depending upon question goals.

### **6.c. Do you usually cough at all on getting up, or first thing in the morning?**

Nine participants answered yes (one tentatively) and twenty participants answered no to this question. Most of those who answered “yes” subsequently described significant levels of coughing. However, one participant initially answered yes based on seasonal allergies, and later modified her response: if it is allergy season and her window is open, then she usually coughs. Another participant initially answered yes but re-thought his response shortly thereafter, reporting that he was talking about the sort of coughing that “everyone” experiences. His response points to at least moderate ambiguity regarding the level of severity that should qualify as a “yes.” The words “at all” in the question might have encouraged him to report relatively marginal coughing, although most other “yes” responses to this question reflected a higher threshold of coughing. If the intent of the question is to get at *any* degree of consistent morning cough, it might be useful to put more emphasis on the words “at all.”

Responses generally were consistent between 6a and 6c, but there were some exceptions. For example, one participant answered “yes” to 6a regarding coughing from asthma, but “no” to 6c; another reported consistent morning coughing at 6c that did not warrant a “yes” response at 6a.

Two participants had a logical problem with how this question is worded. The use of the word “or” led some participants to believe that “getting up” and “first thing in the morning” were separate responses. This confusion could lead some respondents to provide one of those answers rather than a simple yes or no response.

Suggestion: It might be more straightforward to say “when you first get up in the morning” or “when you first wake up.” If you really want to capture any consistent morning cough, put more emphasis on the words “at all.” As noted above, a fixed reference period may help to eliminate some ambiguity regarding coughs related to seasonal allergies.

**6.d. Do you usually cough at all during the rest of the day or at night?**

Thirteen participants answered yes and fifteen participants answered no to this question. One of the yes responses was rather ambivalent about his response (“occasionally maybe—you can say yes”). He and two other participants who answered “yes” had answered “no” to 6a. They based their 6d responses on either seasonal allergies or variety of work sites, and it did not appear that they were really reporting about “usual” coughing.

One additional participant did not answer the question. He found the question difficult because it depends upon his work environment. When exposed to certain irritants, he coughs a lot, but otherwise he does not.

Suggestion: If it is not desirable for this question to pick up individuals with minor, seasonable, or variable coughs, then one might only ask question 6c and 6d of those who said yes to 6a and change the wording to the following, “During the past 12 months, do you usually cough during the rest of the day or at night?” This would reduce the length of the questionnaire and hence the burden placed on those with minor coughs.

**6.e. Do you usually cough like this on most days, for 3 consecutive months or more during the year?**

This question applied to sixteen participants. Eleven participants answered yes, four participants answered no, and one participant could not provide an answer to this question. Several participants expressed some qualifications about “yes” answers (e.g., they usually cough like that *if* they are in certain environments).

Similar to question 6b, the complexity of this question made it difficult for some participants to make a judgment about how to answer. For example, one participant’s answer began with, “again, that’s a tough question...I haven’t really monitored it.”

This question invokes several different time periods: “most days,” “3 consecutive months,” and “the year.” In addition, the word “usually” adds another element of subjectivity. Some participants tried to answer literally and found it difficult to keep these parameters straight. Others seemed to simply make a general assessment as to whether they had a chronic cough or not. Given that, a simpler question might be functionally equivalent.



Note also that “the year” is potentially ambiguous—does it mean the *past* year, the *current* year, or should respondents think more generally (e.g., *most* years)? Should it refer to a time beginning literally one year ago or during the past calendar year?

Suggestion: See suggestions for 6a and 6b. Also, consider being more specific about what “the year” means, and simplify the reference period more generally. Relatively minor changes such as “In the past year, have you coughed like this on most days for three months or longer?” could lead to a more straightforward question. Additional simplifications could also be considered.

#### **6.f. For how many years have you had this cough?**

This question was administered to sixteen participants. Responses ranged from two years to over forty years. Most participants provided approximations covering a range of several years (for example, “7 or 8 years” or “at least twenty years ago”). Generally they thought these responses were in the ballpark but might not be literally correct. A number of participants commented that they did not keep track of this information and it was hard to remember. Several participants with long-term coughs resorted to cruder estimates (“two thirds of the time I’ve been working” and “since my mid twenties”).

Two participants found it impossible to answer the question, apparently because the cough was fairly low-level or had a gradual onset. One weakness of this question is that it assumes the cough has a clear beginning point—that might not always be the case. “This cough” might not be a discrete health event that can be easily categorized.

Probing revealed that at least two participants answered based on the time that they had been formally diagnosed with a condition of some sort. This event was a salient marker, although the actual symptoms might have lasted longer.

#### **6.g. In the past 12 months have you had episodes of severe cough?**

Six participants answered yes and ten participants answered no to this question. All participants who answered yes indicated that they either experienced respiratory problems or had been diagnosed with a respiratory condition. One of these participants explained that she experiences severe coughing when she goes on a coughing jag and has a hard time catching her breath. Another participant was referring to a cough from a cold that was so severe that she could not talk. Another participant mentioned the possibility that he might go into a major coughing fit while being interviewed, describing having an itch and phlegm so bad that he couldn’t stop coughing until his throat was clear.

One participant’s answer to this question appeared to be a false negative. This participant, who was diagnosed with asthma and COPD, had mentioned elsewhere that she frequently coughed so badly that she needed an inhaler to stop coughing. It was hard for this individual to judge how to answer many of the questions on coughing.

**6.h. In the past 12 months, about how many days have you had episodes of severe cough?**

This question only applied to six participants. Responses were varied: one participant answering that it lasted one week during a bad cold; another participant said “five or six”; several others fell into the 8-30 range; and one participant said that it was virtually every day.

At least two of these participants indicated that it was very difficult to answer. One participant said that estimation was difficult due to variety over the course of the year, and was also unclear as to whether the question referred to consecutive days. Ultimately she just answered that it was “three times a month.” Another participant said that it was too frequent to provide a clear estimate. If this participant had been given closed-ended response categories, the response process would have been much easier. That is, he easily could have reported that it was “31 or more days.”

Suggestion: Consider reading the response options, at least if respondents have trouble estimating.

**7.a. Do you usually bring up phlegm from your chest?**

Fourteen participants easily answered no to this question. At least five of them experienced heightened phlegm production from time to time (e.g., during brief illnesses) but did not think this was consistent with the intent of the question.

Of the remainder, thirteen initially answered yes, but at least two of these participants qualified their answers (e.g. “if I’m sick” or “sometimes, it depends on allergies.”) Three other participants expressed uncertainty about their initial response. One was uncertain whether the problem happened often enough to qualify as “usually” (he had a problem with phlegm “sometimes...when it has to come out”). The others primarily had phlegm problems during allergy season and bouts of bronchitis, respectively. Both ultimately decided to answer “no.”

Some participants struggled to determine whether they “usually” bring up phlegm. For example, several participants brought up phlegm once a day (e.g., in the morning) but generally had no other phlegm problems. For others, bringing up phlegm was more sporadic but not necessarily rare. Some participants seemed reluctant to answer “no” as that might suggest that this never or very rarely happens.

As with the coughing question, the ambiguity has the potential to lead to more “yes” responses than intended. Several yes responses seemed rather marginal, but all responses of “no” seemed consistent with the intent of the question. The ambiguity is strongest for individuals who are generally in good health but produce phlegm under certain circumstances. “Yes” responses can mean that they “usually” produce phlegm *during colds or allergy seasons*.

Suggestion: We think that a question with more concrete response criteria would perform better. For example, “During the past [reference period] have you brought up phlegm at least once on most days?” Or, “During the past [reference period], do you usually bring up phlegm four or more times per week?”

If that is too much of a change, consider an introduction that informs the respondent about whether or not phlegm from short term illnesses should be included. This would add some length to the questionnaire, but should lead to more interpretable results. In addition, a reference period should help clarify question intent, and might also help to reduce the number of “sometimes” responses throughout this section.

**7.b. Do you usually bring up phlegm like this as much as twice a day, 4 or more days out of the week?**

This question was administered to thirteen participants. Nine of them answered yes. Generally, it was unambiguous that each of them brought up phlegm at least that often. However, one participant expressed uncertainty regarding how often this actually happens. She had emphysema and thought it was probably that often, but was unsure. She seemed to interpret the question as basically asking “does this happen regularly” and answered yes on that basis.

Two participants could not answer the question. One participant could not answer because there was no definite pattern—she had answered 7a as yes, but probing had revealed that her problems with phlegm varied considerably based on allergy seasons. Respondents who experience such inconsistency may have difficulty answering this with a simple yes or no—it would depend upon time of year. Another participant said that he had never thought about frequency and had no idea whether it lined up with the criteria in the question. Eventually he reported that it might happen 2-3 times per week, but he was unable to compute for himself how to answer this question.

The remaining two participants answered no. One of the participants was probably on the borderline between yes and no—probing revealed that she brought up phlegm at least 3-4 times per week. While actually answering the question, she made more of a general assessment that it didn’t seem quite that frequent. The other participant said “no, not normally.”

Suggestion: Tightening up the previous question (as suggested above) might reduce some ambiguity here. The question is especially difficult for those who provide “marginal yes” responses to 7a. We also noted that several participants found the time periods in the question (times per day and days per week) to be quite complex. Some seemed to simply answer in terms of whether they thought this happened frequently or not. Consider using a specific reference period (e.g., the past month or past year). Also, it would be useful to ask only about one time period in this question. For example, if 7a asked about the number of days per week the respondent brings up phlegm, 7b could ask how many times per day this happens.

**7.c. Do you usually bring up phlegm from your chest on getting up, or first thing in the morning?**

This question was administered to 28 participants. Eight participants answered yes, and probing usually revealed that the situations were unambiguous. There was one exception: a participant who subsequently explained that he only had this problem while he had a cold.

Nineteen participants answered no. Here also, most participants answered easily and reported little ambiguity. One exception was a participant who reported problems during allergy season, especially if she slept with an open window.

One additional participant had a difficult time committing to yes or no, only answering “sometimes.”

Suggestion: As discussed earlier, it might be useful to re-think the use of the word “usually,” and it might also help to provide guidance related to excluding short-term symptoms from brief illnesses.

**7.d. Do you usually bring up phlegm from your chest during the rest of the day or at night?**

Eleven participants answered yes to this question. At least two responses seemed fairly marginal. One participant reported minor problems with phlegm, possibly three times a week and more likely to be a problem in the evening. It was unclear whether this should qualify as “usually” bringing up phlegm. Another participant had previously indicated that she brought up phlegm about three or four times a week, and that this only happened when she was lying down. Here, it seemed that she didn’t mean “usually” as in frequently—rather, she meant that when it (occasionally) happens, it is usually or always at night.

Sixteen participants answered no. Their responses all seemed straightforward.

A general comment on the series 7a-7d: we noticed that virtually everyone who answered “no” to 7a also answered no to 7c and 7d. There were only two exceptions, and both of these subsequent “yes” responses were marginal—one participant reported phlegm during colds in 7c, and another reported phlegm a few evening per week. In our study, when participants answered “no” to 7a, later questions (7c and 7d) did not seem to provide any additional information. However, when the response to 7a was “yes,” there was considerable variety afterwards, with some saying yes to 7c and 7d, some saying no to both, and some saying yes to one and no to the other.

Suggestion: As noted earlier, the word “usually” seems to produce ambiguity. It may be worthwhile to consider alternatives. As written, 7c and 7d may not provide additional information regarding those who say no to 7a. If the current wording is retained, it might

be more appropriate to skip the next questions to avoid picking up marginal “yes” reports.

**7.e. Do you bring up phlegm like this on most days for 3 consecutive months or more during the year?**

This question was administered to fourteen participants, eleven of whom answered “yes.” Some “yes” responses reflected chronic problems with phlegm. For example, five participants had answered yes to 7a, 7c and 7d, and all of them answered yes to this question as well, citing daily phlegm problems. However, some others answered yes on the basis of having phlegm problems only during allergy season or based on varying conditions at work.

Three participants answered no. All of these participants had earlier reported fairly marginal phlegm symptoms (e.g., yes, but only a few times a week or during colds).

Probing suggested that several participants interpreted the question in general rather than literal terms. The question is complicated because it includes references to “most days,” “3 consecutive months,” and “the year.” If they considered phlegm to be a regular or severe problem, they answered “yes”; if not, they answered “no.” Occasionally, this might have yielded responses that were not literally correct (i.e., common and serious problems but not necessarily for three consecutive months).

Suggestion: Consider simplifying the question. One alternative that retains the “three consecutive months” threshold is: “In the past year, have you brought up phlegm like this on most days for three months or longer?”

**7.f. For how many years have you had trouble with phlegm?**

Responses to this question varied quite widely, ranging from less than a year to over 20 years. A number of responses were initially imprecise (more than fifteen years, somewhere between 6 and 8 years, and so on). It will be necessary to establish interviewing conventions for handling imprecise responses.

The most significant issue with the question was that several participants disagreed with its overall premise, that they had “trouble” with phlegm. Several participants thought that their symptoms were fairly common and that they have learned to live with them without complication. Another participant said that phlegm production is healthy and actually deliberate on his part—it is a healthy process to expel elements that he might have been exposed to on the job.

We also observed that at least three participants answered based on the timing of a diagnosis, rather than symptoms per se. For example, one participant said that it was 10 years, because that’s how long ago she was diagnosed with emphysema. It is likely that some participants actually experienced these symptoms to a significant degree for longer than they reported.

One participant did not answer the question at all, noting that he never thought about it and refused to be a “whiner”—he just learned to live with it.

Suggestion: Avoid the word “trouble,” which adds an element of subjectivity. Instead, ask how long they have *experienced symptoms*. This question might also work better if it directly followed 7a or one of the earlier questions. That is, after determining whether they bring up phlegm, ask how long they have done this.

**8.a. In the past 12 months, have you had periods or episodes of cough with phlegm that lasted 1 week or more? If you usually have cough and phlegm, please count only periods or episodes of *increased* cough and phlegm.**

Twelve participants answered yes to this question, and sixteen answered no. The most significant source of ambiguity seemed to be whether colds should be included. Some participants answered yes on the basis of having a cold. Others answered no, but when probed clarified that if colds were to be included, the answer would be yes. At least one other participant answered no, but when probed said that if we wanted allergy season to count, her answer would have been yes. Some of these participants explained that they perceived that the question was supposed to capture more serious respiratory conditions.

Two participants did not answer. The first did not understand whether the question referred to continuous or cumulative periods of increased phlegm production; the other indicated that he had no idea—he has cough and phlegm often, but pays little attention to it and said that he could not report about frequencies.

We observed numerous indications that participants had trouble with this question due to its complexity. One was that quite a few participants asked for the question to be repeated. Another was that several expressed confusion about the intent and meaning of the question—for example, some indicated that this was virtually identical to what they had already reported, and did not catch the fact that this question referred to *increased* phlegm production. Probing revealed that several participants with daily phlegm problems answered yes on that basis, rather than reporting increases over normal.

Since we will know from previous answers whether respondents have problems with cough or phlegm, the question could be tailored based on previous responses. This would greatly simplify the question for respondents, eliminating a key judgment (“if you usually...”).

At least one participant failed to include a significant illness because incorrectly dated a serious illness. Probing revealed that it had fallen within the past 12 months, whereas she originally thought it had been earlier. It is difficult to completely prevent problems of this type, although it is possible that they can be exacerbated by high demands from question comprehension.

Suggestion: Consider tailoring this question based on responses to 6a and 7a. For example, the second sentence could be dropped for respondents who answered no to 6a and 7a. For those respondents who already reported some coughing or phlegm, consider asking: “In the past 12 months, have you had any periods lasting one week or longer where you had more coughing or phlegm than usual?”

### **8.b. About how many such episodes have you had in the past 12 months?**

Most participants provided answers between one and three, generally reporting colds or other notable illnesses). However, a few participants gave answers such as 12 or 15. Some participants with higher frequencies gave ranges such as “10-12” as it was difficult for them to remember exactly. They seemed to recall patterns such as “at least once a month” and answer on that basis.

### **8.c. For how many years have you had at least 1 such episode per year?**

Responses ranged from one to twenty years. Many responses were expressed in general terms (3-5 years, 15 or more years). Most seemed to be approximations, although participants could often link their responses to particular events, such as time spent on a certain job. One participant reported that episodes have become more frequent over time, and it was somewhat challenging to think about when they actually began.

### **9.a. Have you ever had wheezing or whistling in your chest?**

Twenty participants answered yes and ten participants answered no to this question. Most “yes” responses reflected experiences with asthma, bronchitis, or various other illnesses such as colds. We were uncertain as to whether a few reports should count as wheezing or whistling—for example, one participant described a sound made from phlegm during exhaling, and another’s description sounded like labored breathing. A few participants provided rather strange descriptions of “purring” or “rattling” sounds. It is difficult for us to evaluate whether these fit the intention of the question, but the participants thought these symptoms applied.

As with other questions, one of the most significant points of ambiguity was whether or not symptoms associated with colds or the flu should count. Probing revealed that at least two participants answered no, but had experienced wheezing or whistling during relatively short illnesses. They thought that the question was targeting more regular or severe problems, not symptoms from relatively minor illnesses. A few participants who answered “yes” also expressed some confusion as to whether symptoms during colds should count.

Suggestion: Put additional emphasis on the word ever. Consider additional language such as “even if it only lasted a short time.”

**9.b. About how old were you when you first had wheezing or whistling in your chest?**

Answers to this question varied widely, with one participant reporting such an incident at age 2, and others reporting first experiences within the last few years. Those who had experienced a significant problem such as an asthma attack were generally able to give specific responses. However, we noted that some provided the age of first diagnosis—first symptoms could have occurred sooner.

One participant who had experienced numerous problems due to both injury and illness (asthma) had a difficult time pinning down her response to within a few years. More generally, participants with gradual onset of symptoms or sporadic experiences were sometimes less precise with their responses.

Note that failure to consider wheezing or whistling from short illnesses could affect responses to this question as well as the previous one. If respondents experienced several minor incidents of whistling or wheezing prior to a more formal diagnosis, they might report only the latter. It is difficult to tell for certain whether this happened in our study—we did not always probe along those lines—but it seems likely, as some participants thought that wheezing or whistling from short illnesses did not apply.

Suggestion: Ask how old respondents were when they first experienced any wheezing or whistling in the chest.

**10.a. Have you ever had an attack of wheezing or whistling in your chest that made you feel short of breath?**

This question was administered to 21 participants. Ten of these participants answered yes, generally referring to attacks brought on by conditions such as asthma, bronchitis, or bronchopneumonia, and sometimes COPD or other conditions. Probing suggested that these responses were accurate.

Eleven participants answered no, but it seemed to us that at least three of those responses could have qualified as “yes.” In two cases, participants noted that they had had attacks that made them short of breath, but they interpreted the question as getting at something more severe than what they experienced. One of these participants seemed to compare her attack with a truly severe attack that had actually killed her sister. Another participant had experienced shortness of breath in an attack, but thought that question referred to attacks that actually made it impossible to breathe. A third participant reported having an attack that forced her to sit, relax, and wait it out. She answered “no” because she could prevent herself from actually getting short of breath, but it seemed to us that the effect was the same—she had to completely stop what she was doing.

One other participant reporting having an attack during a bout of bronchitis that gave him coughing spasms and produced some unusual chest sounds. It was ambiguous as to whether this actually produced shortness of breath.



In general, it seemed that participants leaned toward “no” responses when there was ambiguity because they thought the question was getting at “serious” incidents. It is possible that the word “attack,” which carried some connotations of severity, is driving such interpretations. Several participants who answered yes also indicated that they were thinking about very serious incidents when responding.

Suggestion: Consider dropping the word “attack” if there are concerns about underreporting (e.g., “have you ever had wheezing or whistling in your chest that made you feel short of breath?”) with this question.

#### **10.b. About how old were you when you had your first such attack?**

Responses ranged from childhood to recent adulthood. Sometimes the timing of such attacks was memorable because the attack corresponded with a particular illness or diagnosis. Other responses were approximations, sometimes offered in terms of ranges (“my late 40s or early 50s”) or with qualifiers such as “about” or “probably.”

#### **10.c. Have you had 2 or more such attacks?**

Seven participants reported having two or more such attacks. We observed no particular problems with the question (although some overall underreporting is possible, given the conservative interpretations reported at 10a).

#### **10.d. Have you ever required medicine or treatment for such attacks?**

Six participants answered yes to this question; there did not seem to be any difficulties or ambiguities regarding their responses.

Three participants answered no. One of these participants had received antibiotics for the underlying condition, but not for the “attack” per se. The other two participants indicated that they should have gotten treatment and probably “needed” it, but did not actually receive it.

One other participant could not remember whether he actually went to the doctor after experiencing his attack. It had only happened once, but he had frequent bouts of other respiratory problems.

Suggestion: It would be less ambiguous to ask whether respondents have *received* medicine or treatment. If you are really interested in whether respondents believe they needed treatment, it might be best to ask this as a follow-up question (e.g., “Have you ever thought you required medicine or treatment for such attacks, even if you did not receive it?”) Of course, there would be a great deal of subjectivity in such judgments.

**11.a. In the last 12 months, have you had wheezing or whistling in your chest at any time?**

This question was administered to 21 participants. Nine answered yes and twelve answered no. Those who experienced wheezing and whistling in the last 12 months were not always the same participants as those who had experienced “short of breath” incidents (i.e., answered yes at Q10). Six out of the nine participants who answered yes to Q11a, had answered yes to Q10. Also, eight out of the twelve who answered no to Q11a, had answered no to Q10. We did not observe any particular difficulties with this question.

**11.b. In the last 12 months, does your chest ever sound wheezy or whistling when you have a cold?**

Seven participants answered yes and two answered no to this question.

This question makes a tacit assumption that the respondent has had a cold during the last 12 months. Some problems emerged when this was not the case. For example, we interviewed two participants who had frequent wheezing, neither of whom had a cold during the past 12 months. One participant answered yes, because she experiences wheezing frequently whether or not she has a cold. But the other participant answered no because he has not had a cold during the past 12 months.

Suggestion: If this question is retained, it would be useful to add a screener (e.g., have you had any colds in the last 12 months); the subsequent question about wheezing during colds would be asked only of those respondents who said yes.

However, if the ultimate intent of this series is to distinguish between wheezing due to transient conditions and wheezing from asthma or other chronic conditions, it might be useful to ask respondents whether they experience these things only when they have illnesses such as cold or flu.

**11.c. In the last 12 months, does your chest ever sound wheezy or whistling occasionally apart from colds?**

Seven participants answered yes and one participant answered no to this question. Upon closer inspection, the “no” response appeared to be a false positive—the participant was confused by “occasionally apart from colds.” She was trying to indicate that she did experience wheezing when she had no cold.

If these questions are designed to distinguish wheezing due to transient illnesses from other sorts of wheezing, it might be more straightforward to ask respondents to choose between alternatives such as (1) I only experience wheezing or whistling when I have a cold [or flu, or allergies—whatever best reflects the intent of the question]; (2) I experience wheezing and whistling even when I do not have a cold [or flu, etc.]

Suggestion: Combine this question and 11b into a sort of multiple-choice question. If the question is more or less retained as is, reword “occasionally apart from a cold,” which is highly confusing.

**11.d. In the last 12 months, does your chest ever sound wheezy or whistling more than once a week?**

This question was administered to nine participants. Five participants answered yes and two answered no without any particular difficulties.

One participant originally answered “sometimes,” but upon probing thought that he probably experienced this more than once a week. He indicated that it would be easy to ignore the frequency of his symptoms, but he was somewhat more cognizant of them because he has been formally diagnosed with COPD.

Another participant indicated this was hard to answer because he thought it happened once a week, and it was difficult to say whether or not it was more than that.

Suggestion: Consider combining Q11d and Q11e into a single frequency question (e.g., do you experience this every day, a few days a week, a few days a month, and so on.)

**11.e. In the last 12 months, does your chest ever sound wheezy or whistling most days and nights?**

Five participants answered yes and three answered no. Only one participant had trouble answering, saying that it was “mostly nights” that he experienced these problems.

Suggestion: As suggested above, consider asking a single frequency question about wheezing and whistling, combining 11d and 11e and using different response options.

**12.a. In the last 12 months, have you been awakened from sleep by coughing, apart from a cough associated with a cold or chest infection?**

Eight participants answered yes to this question and 22 answered no. Most responses were straightforward. However, probing revealed that several participants did not hear the question correctly, thinking that it asked if this happened when they had a cold. At least one “yes” response was incorrect for that reason, and at least one other participant (who answered no) misheard the question in the same manner.

We believe that the question suffers from two problems. One is its complex structure and overall length. A few participants clearly were not paying attention to the nuances of the wording. In addition to the incorrect interpretations noted above, another participant indicated that she thought the question was about wheezing, suggesting drifting attention. The other problem is that the term “apart from” was too subtle for some participants to grasp.

Suggestion: Because there are two key concepts in this question, consider breaking it into two parts. First, ask whether coughing has awakened the respondent at all during the last 12 months. Then, ask an additional question to determine whether this happened only when the respondent had a cold or chest infection, or whether it sometimes happened even without a cold or chest infections (see suggestion for Q11c). Separating the material in that manner should also solve problems with length and subtle wording.

At a minimum, clarify the wording by asking “In the last 12 months, have you ever been awakened from sleep by coughing, when you did *not* have a cold or chest infection?”

***12.b. About how old were you when you were first awakened from sleep by coughing, apart from coughing associated with a cold or chest infection?***

Eight participants answered this question. We did not observe any serious problems, although it was clear that some participants could only provide rough estimates. One participant pointed out that her response reflected the first time she really noticed the problem, and that it might have started even sooner.

Suggestion: Simplify the language in the question (especially “apart from”) in a manner consistent with any changes made to Q12a.

**13.a. In the last 12 months, have you been awakened from sleep by shortness of breath or a feeling of tightness in your chest?**

Nine participants answered yes to this question, and 21 answered no. We observed very few signs of overt problems. The most significant issue was that several “yes” responses seemed a bit marginal—one participant mentioned having the heat on too high in winter, and another participant mentioned snoring. One other said that he experiences such symptoms during a cold or an anxiety attack. Most others thought about more serious respiratory conditions.

Interestingly, a few participants who answered “no” reported that they thought of heart attacks rather than respiratory conditions when they heard the question.

**13.b. About how old were you when you were first awakened from sleep by shortness of breath or a feeling of tightness in your chest?**

Nine participants answered this question. As with similar question such as 12b, some participants could only provide general approximations.

**14.a. In the past 12 months, have you been bothered by sneezing or a runny or blocked nose when you DID NOT have a cold or the flu?**

Fifteen participants initially answered yes, and fifteen answered no. Most commonly, those who responded yes reported having allergies, some seasonal and some year-round. A few also reported symptoms that were exacerbated by job activities.

One participant initially answered no, not remembering her problems with allergies. An additional no response appeared to be in error—the participant later indicated that he experienced symptoms of hay fever.

Two other “no” responses appeared to be in error. In one case, the participant thought the question was asking whether he experienced such symptoms during the entire 12 month period, and his symptoms were merely intermittent. In another, the participant had recently had surgery for apnea. He answered no because he considered the symptoms to be atypical for him.

Suggestion: Consider asking whether respondents have experienced symptoms in any of the past 12 months. It might be useful to follow up “no” responses with an additional prompt about seasonal allergies, which appear to be forgotten occasionally.

**14.b. In which of the past 12 months were you bothered by sneezing or a runny or blocked nose when you DID NOT have a cold or the flu?**

Three participants reported that they experienced these symptoms virtually all the time, but most participants indicated that they experienced them for only a portion of the year.

Many participants had difficulty providing specific responses to this question. The problems appeared to be multi-faceted:

- About five participants had trouble identifying the particular months in which they experienced symptoms, either because they could only narrow it down to approximate seasons, or because there was no definite pattern to the symptoms (e.g., they flare up from time to time) or because the particular months were difficult to recall (e.g., they were associated with a particular job, but the participant couldn’t remember when he held that job for certain).
- About two participants had moderate symptoms all the time, but heightened symptoms during certain months—they were uncertain whether to report all months or just the heightened months.
- Several other participants gave imprecise or inconsistent answers or answers that changed easily after probing—for example one participant reported two months of symptoms, but remembered additional months after some basic probing.
- Some participants had difficulty thinking about the last 12 months because the starting and ending points were not particularly memorable. Participants who tried to use the questionnaire as a visual reference became especially confused. For example, when considering the time period of July 2005 to June 2006, the months January through June on the questionnaire would refer to 2006, while July to December would refer to 2005.

Suggestion: It is very difficult to respond with the level of detail that this question asks for. Consider asking about general seasons, or at least be prepared to accept such responses from those who have trouble being more specific. At a minimum, provide a

calendar or other visual aid to respondents to help them clearly visualize the months that we are interested in.

**14.c. When you are away from your current job (such as on weekends or vacations) are your nose symptoms better, worse, or unchanged? (If more than one current job, consider the job you spend the most time doing.)**

This question was administered to approximately thirteen participants. The question was straightforward for those participants whose symptoms were primarily job related (about three participants answered “better”) and for those whose symptoms clearly had nothing to do with their jobs (about five participants answered “unchanged”).

Several other participants said “it depends.” For one participant, job exposures and stressors interact to create symptoms, making it hard to judge whether symptoms are worse on the job or off. For another participant, symptoms were worse off the job in summertime, because allergies exacerbate symptoms outside her office; however, in winter, the dust inside her office might be worse than conditions outside. Another participant with more than one job said it depends on the job.

A few participants did not have any job, and the question did not make sense to them.

Suggestion: Determine work status prior to this question and only ask it participants currently working. Consider simplifying the question to ask whether symptoms are worse than usual when working (if necessary, add “at the place you work most often.”)

**15.a. In the past 12 months, have you been bothered by watery, itchy, or burning eyes when you DID NOT have a cold or the flu?**

We administered this question to 27 participants. Thirteen participants answered yes and fourteen answered no. At least five of the yes responses were from participants who experienced seasonal allergies. One participant who answered yes had eye symptoms for different reasons over the year (pollen in summertime, and dryness in the air during wintertime). At least one participant answered yes based upon more general “eye problems” that may not have been related to the intent of this question.

At least four participants initially answered no, even though probing revealed that they experienced symptoms due to allergies or hay fever. Some of these responses might be considered false negatives. One participant seemed to think that the question was getting at something more serious than routine allergy symptoms, perhaps because such symptoms had already been covered elsewhere in the questionnaire. Another participant said that he was thinking about eyes generally and not specific irritants. Also, one participant said that his symptoms did not seem continuous or serious enough to count in this question.

Suggestion: Consider explicitly mentioning the word “allergies” in the question, to emphasize that such symptoms should be included in responses. As suggested for Q14a,

consider asking whether respondents have experienced symptoms in any of the last 12 months.

**15.b. In which of the past 12 months were you bothered watery, itchy, or burning eyes when you DID NOT have a cold or the flu?**

Thirteen participants answered this question. It was generally easier for participants to provide the months that these eye symptoms occur compared to the nose symptoms in question 14b. However, one participant had a hard time reporting the months that her symptoms occur because the symptoms change from year to year.

Five of the positive responses to this question were from participants who experienced seasonal allergies. Many of these participants found it easier to identify the season when they have problems rather than any particular month. In contrast, some participants experience these symptoms all of the time. For example, one participant experienced watery, itchy, or burning eyes year round due to allergies.

Suggestion: See suggestion for Q14b.

**15.c. When you are away from your current job (such as on weekends or vacations) are your eye symptoms better, worse, or unchanged? (If more than one current job, consider the job you spend the most time doing.)**

Eight participants answered this question. Seven of these participants answered “unchanged.” One of these participants did not understand that this question was asking about eye irritants—she answered “better” because she was a bus driver and had to strain her eyes often at work. After some probing, the participant decided that the question was asking about allergies and changed the answer to “unchanged.” Another person said that it depends on what type of job he is doing at work.

This question was not applicable to one person who was not currently working.

Suggestion: See suggestion for Q14c.

**16. When you are near animals such as cats, dogs, or horses or near feathers including pillows, quilts or comforters or in a dusty or moldy part of the house, do you ever: start to cough? start to wheeze? start to feel short of breath? get a feeling of tightness in your chest? get a runny or stuffy nose or start to sneeze? get itching or watering eyes?**

One problem with this question is the order in which the symptoms are presented. Sneezing was the primary symptom related to these stimuli—in fact, when asked about coughing, at least four participants volunteered that they are much more likely to sneeze. Overall, twelve participants said that they experience a runny or stuffy nose or start to sneeze in response to one or more these stimuli, and eight participants experienced itchy

or watering eyes. In contrast, only five participants said they cough in response to any of these stimuli, and even those who cough usually experience nose symptoms as well.

This question is also complex because it asks respondents to consider several different stimuli at once. Some participants had different reactions to the different stimuli. For example, one participant experienced coughing, wheezing, and shortness of breath in response to dust and mold, but nose and eye symptoms when exposed to cats and feather bedding. Others experienced some symptoms to one or two of the irritants but no symptoms at all to the rest. For example, six participants had symptoms when exposed to dust or mold, but few or no symptoms when exposed to animals or feathers. One of these participants really was not sure how to answer this series of questions without clarifying that she only had these symptoms around dust, and others expressed confusion or reservations about their responses.

One participant was not sure what was meant by a dusty or moldy “part of the house.” This participant had difficulty with this wording because he had problems with dust at work, but not at his own home. The participant was not sure if the question referred specifically to his own house or whether it also referred to houses that he works at during construction jobs.

One other participant experienced itching and watery eyes, but due to dryness rather than any environmental irritants. He answered no (we believe correctly) but expressed some uncertainty about how he should answer.

Suggestion: One minimal change is to ask this question so that the most common symptoms (nose and eye symptoms, especially sneezing) are asked about first. A more substantial alternative would be to decompose this question so that it asks about the different stimuli in this question separately (e.g., asking about irritation from dust and animals as separate questions). This would add length to the questionnaire, but should make it easier for respondents to answer the individual symptom questions.

**17. When you are near trees, grass, or flowers, or when there is a lot of pollen in the air, do you ever: start to cough? start to wheeze? start to feel short of breath? get a feeling of tightness in your chest? get a runny or stuffy nose or start to sneeze? get itching or watering eyes?**

As with the previous question, sneezing was the primary symptom related to the stimuli in question 17. Once again, three participants said that sneezing is the primary symptom of exposure to these stimuli immediately after they were asked if these stimuli made them cough. Two others interrupted the interviewer during the reading of other stimuli and said sneezing was the primary symptom. The frequency of the responses is revealing: seventeen participants said that they sneeze in response to these stimuli. This is followed by thirteen participants who experience itchy or watering eyes. Eight participants cough in response to these stimuli.



Although this question also lists multiple stimuli, it appeared that most participants viewed these as one collective stimulus. Generally, participants had fewer problems answering than with Q16. Several participants mentioned that they experience these symptoms at specific times of the year or in specific outdoor settings such as when mowing the lawn. However, one participant only heard the word “flowers” when she was asked the question, and initially answered no. The participant changed her answer to yes when the interviewer probed and asked specifically about pollen. This problem seemed to be more of an indication that the participant was losing motivation rather than a problem with the wording of the question.

**18. When you are near strong odors such as perfume or bleach or near smoke, do you ever start to cough, wheeze, feel short of breath, or feel tightness in your chest?**

Eighteen participants answered yes and ten participants answered no to this question. The participants were generally able to answer this question without much difficulty, even though most participants only experienced a subset of symptoms or were bothered by a subset of the stimuli in question. For example, two participants described how bleach made them wheeze or have difficulty breathing, while two others indicated that it made their eyes itchy or watery; other participants noted that some perfumes make them cough or feel short of breath. One participant expressed moderate confusion about how to answer, given that smoke was the only significant irritant on this list and it only made him cough. While there were few overt indicators that the question overwhelmed participants, we think it will be less confusing to split the question into simpler components.

A couple of participants indicated that they were irritated by cigarette smoke, but answered no, reasoning that virtually everyone is irritated by direct smoke and that they can generally avoid this exposure. However, a few other participants who experienced similar irritation answered yes.

A few other participants qualified their answers—for example, two participants explained that they have some symptoms in reaction to bleach or other chemicals, but the chemicals have to be quite strong to cause a problem.

One participant questioned why we did not include auto emissions. He found those to be more irritating than anything else mentioned in the question, and thought that it was a similar sort of irritant.

Suggestion: Consider decomposing this question so that it asks about the different stimuli in this question separately. This would add length to the questionnaire, but should make it easier for respondents to answer the individual symptom questions. Consider dropping smoke, or moving it to a separate question, because most people are irritated by direct exposure to smoke to some degree, and its inclusion creates some ambiguity. Also consider whether irritants such as automobile exhaust should be included here or addressed in a different question.

**19. When you exercise or exert yourself or when the air is cold, do you ever start to cough, wheeze, feel short of breath, or feel tightness in your chest?**

Eleven participants answered yes and sixteen participants answered no to this question. Three participants clearly based their answer on how they feel when the air is cold. For example one participant said that the dry air in the winter time causes her to cough. Another participant initially answered no to this question because she was thinking mostly about cold weather. However, when the interviewer asked about exercise, the participant wanted to change the answer to yes because she sometimes gets exhausted when exercising. It appeared that this participant did not understand why exercise was included in this question, so she based her initial answer on the cold weather component.

Other participants focused more closely on exercise when answering this question. Four of these participants described symptoms that were out of the ordinary such as coughing, wheezing, or tightness in the chest when they exercised or overexerted themselves. However, some participants did not understand the purpose of asking about exercise in this question. One participant said that she may cough during exercise, but this happened only when her throat was dry from not having enough water. This participant also questioned whether it made sense to ask about shortness of breath in this question because she thought that was the purpose of an exercise workout. Two other participants described symptoms that were consistent with normal shortness of breath that was caused by performing physical activity when they were not in shape.

Suggestion: Because cold air and exercise reflect such different circumstances, it is probably better to ask about them separately. It would also be helpful to clarify the nature of the symptoms that this question is intending to capture with respect to exercise.

**20. Are you unable to walk due to a condition other than shortness of breath?**

Twenty one participants answered no and one participant answered yes to this question. The one participant who answered yes to this question was unable to walk due to arthritis.

For several participants, this question was not straightforward. It combines two concepts and is worded in the negative. Two participants needed to have the question repeated in order to answer. One of these participants was asked to rephrase the question and thought that it was asking, “When you walk, do you have a problem with shortness of breath?” Fortunately, this participant did not have any trouble with shortness of breath so she answered no. However, this is an incorrect interpretation of the question and could plausibly lead to an error if others interpret the question in the same manner.

Suggestion: Although it might seem inefficient, it is most cognitively straightforward to ask this in three questions. The first question should ask whether the respondent has any difficulties walking. The second, if respondents answer yes, should ask “are you unable to walk at all?” Then, if the respondent answers no, ask, “Is this due to a physical condition other than shortness of breath?” Most respondents will only receive one

question, which will be more straightforward. Respondents with mobility problems will receive several short and simple questions rather than one that is difficult to grasp.

**21.a. Are you troubled by shortness of breath when hurrying on level ground or walking up a slight hill?**

Seven participants answered yes and nineteen participants answered no to this question. Three positive responses to this question were from participants who have chronic respiratory conditions that cause frequent problems with shortness of breath.

However, others interpreted this question to include shortness of breath that is attributed to something other than a respiratory condition. For example, three positive responses were from participants who attributed their shortness of breath being out of shape. A third positive response was from a participant who attributed her shortness of breath to stress, because she lives in an unsafe neighborhood and has to hurry when she runs errands. If such answers are outside the intended scope of this question, it might be necessary to rework this item.

Suggestion: Define shortness of breath before question 20 or 21, or consider alternative wordings such as “do you have trouble breathing normally.” Also, consider dropping “troubled by”—it is possible for respondents to *have* shortness of breath without being “troubled” by it.

**21.b. Do you have to walk slower than people of your age on level ground because of shortness of breath?**

Six participants answered no to this question. One participant interpreted the question quite literally. This participant answered no because she does not “have” to walk slower than others, but she usually ends up doing so.

Suggestion: Ask, “Do you walk slower than people of your age on level ground because of shortness of breath?”

**21.c. Do you ever have to stop for breath when walking at your own pace on level ground?**

Five participants answered no and one participant answered yes to this question. Probing did not reveal any noteworthy issues with the question.

**21.d. Do you ever have to stop for breath after walking about 100 yards (or after a few minutes) on level ground?**

Four participants answered no and one participant answered yes to this question. Probing did not reveal any noteworthy issues with the question.

**21.e. Are you too short of breath to leave the house or short of breath on dressing or undressing?**

Four participants answered no and one participant answered yes to this question. One participant reported that she gets short of breath when putting on her shoes.

**22.a. In the past 12 months, have you snored while you were sleeping?**

Twenty-three participants answered yes and two participants answered no to this question. Nearly all of the participants who answered yes said that they know they snore because someone who lives with them has told them. One of the negative responses to this question was from a participant who initially answered “don’t know” because she really was not sure if she snored. This participant has lived alone for quite a while so no one has been around to inform her if she does snore.

**22.b. In the past 12 months, about how many nights per week do you snore?**

Nearly all of the participants who answered yes to this question were basing their answer on what others told them about their snoring. This means that many participants are probably doing little more than guessing how many nights per week that they snore. In fact, one participant noted that that he and his wife “had never charted it.” One participant was basing his answer on how often he snores when he takes a nap during the day because this is when others were around to tell him that he snores. However, since he lives alone, he did not know how often he snores at night.

One potential problem with this question is that the answer categories are double-barreled. For example, “sometimes” is defined as 1-2 nights per week in the questionnaire, but a respondent might consider sometimes to be less than one night per week. Also, one participant said that he snored maybe five times per year and finally selected the “rarely” response category. However, he preferred that the category was called “very rarely.”

Rather than providing both vague quantifiers (“sometimes”) and numerical frequencies, it might be better to ask for numerical frequencies alone. Participants were generally comfortable providing a numerical answer of the number of nights per week that they snore. Eleven participants gave a numerical answer in response to this question. Three others said that they snore “every night” or “always.” One of these participants clarified that he snores pretty much every night, but it can vary. This may be an indication that the reference period is too long for this question.

One participant did not know how to answer this and the next few questions about sleep related problems, because he had undergone surgery for sleep apnea within the past 12 months. He also currently wears a snore guard. His answer to this and many of the following questions would be yes prior to surgery and no afterwards. He also said that it depends on whether the question is referring to with or without the use of a snore guard.

Suggestion: The subjective words that go along with the response categories could either be dropped. It would also be helpful to clarify whether the question is referring to with or without the use of devices such as snore guards.

**23.a. In the past 12 months, have you snorted, gasped, or stopped breathing while you were asleep?**

Eight participants answered yes and eighteen participants answered no to this question. Most of the positive responses to this question were from participants who described fairly dramatic events. Four participants associated this question with sleep apnea.

One participant answered yes to this question because she snores and thought that these symptoms should go hand in hand with snoring. However, she indicated that she had never been told about this or awakened from any of the symptoms. In other words, her answer was based on speculation that these symptoms probably accompany snoring.

Some participants heard the words in the question incorrectly. One participant thought the interviewer asked if she had ever “snorted gas.” This was also a problem with previous testing of these questions in 2004. At that time one participant heard the word “gassed” rather than “gasped.”

Suggestion: Consider asking, “In the past 12 months, have you snorted or stopped breathing while you were asleep?” or, “...have you gasped or stopped breathing while you were asleep?”

**23.b. In the past 12 months, about how many nights per week do you snort, gasp, or stop breathing while you are asleep?**

Eight participants who answered yes to 23a were asked this question. Five participants said that it is noticeable when these symptoms occur. They described quite dramatic events such as waking up or having someone else wake them up because they were not breathing. These participants were able to answer this question with little difficulty.

Three other participants could not provide an answer to this question. One could not provide an answer because he lives alone and no one was around to tell him how often this happens. A second participant said that no one had ever told her that this happens so she really had no idea of the frequency. The third participant said one to two nights per week, but qualified that his wife could answer better.

Suggestion: See comment to 23a and modify this question accordingly.

**24.a. In the past 12 months, have you had excessive (too much) daytime sleepiness?**

Nineteen participants answered no to this question and seven participants answered yes. Interpretations varied on this question. Some participants interpreted the question as referring to drowsiness or being so tired that it affected their ability to function during the

day. A few participants seemed to exclude instances where this was clearly attributable to not getting enough sleep on a previous night. However, other participants were clearly including instances when they did not get enough sleep on a prior night. Four positive responses were from participants who did not get enough sleep on a prior night due to work scheduling or staying out late for a social occasion. Another positive response was from a participant who is frequently tired because she takes several medications that make her drowsy.

Two participants, who answered no, thought that this question was asking whether or not someone takes too many naps during the day.

It is not clear whether or how the parenthetical “too much” in this question is supposed to be read. Generally, interviewers did not read it in this study because it was awkward to read.

Suggestion: Remove the parenthetical and either ask “In the past 12 months, have you had excessive daytime sleepiness?” or “In the past 12 months, have you had too much daytime sleepiness?”

**24.b. In the past 12 months, about how many days per week have you had excessive (too much) daytime sleepiness?**

This question was only administered four times. One participant’s response was “two.” Probing revealed that he was thinking about the last week, rather than broad patterns over the past 12 months (although this might not have changed his answer).

Suggestion: As with 24a, remove the parenthetical expression. Consider switching “days per week” to “days per month,” which would employ one less time period in the question.

**25. In the past 12 months, about how many days of work or school did you miss because of respiratory illnesses or symptoms?**

Only two participants said that they missed work. One participant missed four days of work due to colds and remembered the specific months in which these days occurred. However, it was not always clear to the participants whether common colds should be included in their answers to this question. For example, one participant clarified that he had missed about three days throughout the past 12 months due to colds, but had not missed any days due to any serious respiratory illnesses that were asked about in the questionnaire.

Another participant was slightly annoyed by this question, because it assumes that she was either working or going to school.

Suggestion: This question assumes that someone has a job or attends school. This should be determined beforehand so that appropriate skip patterns can be used in the

questionnaire. It would also be helpful to clarify whether days missed due to common colds should count.

**26.a. In the past 12 months, have you had respiratory symptoms such as cough, wheeze, shortness of breath, or chest tightness that changed on weekends, vacations, or other times when you were away from your current job? If more than one current job, consider the job you spend the most time doing.**

Two participants answered yes and eighteen participants answered no to this question. Two positive responses were obtained from participants whose symptoms did get better when they were away from their current job. However, this question's long and complex wording created some problems. At least three other participants gave false negative responses. All of these participants indicated in answers to other questions or in the explanation of their answers to this question that exposure to irritants at work causes their symptoms to be worse. Another participant needed to have the question repeated without the dangling sentence at the end in order to answer the question.

Suggestion: Use additional information about work history to tailor the question such that the second sentence is read only if it is needed. If this material is read, incorporate it into the question itself (e.g. "Thinking about the job you spend the most time doing—in the past 12 months...") An alternative, simpler version of the question would be: "In the past 12 months, have you had respiratory symptoms that got better when you were away from your current job?"

**26.b. In the past 12 months, did your respiratory symptoms get better or worse when you were away from your current job?**

This question was not extensively tested. Two participants said that their symptoms got better when they were away from their current job.

**26.c. Is your chest tight or your breathing difficult on any particular day of the week?**

**26.d. On which day(s) is your chest tight or your breathing difficult?**

**26.d.1. 1st day back to work after several days away from your current workplace?**

**26.d.2. 2nd day back to work after several days away from your current workplace?**

**26.d.1. 3<sup>rd</sup>, 4<sup>th</sup>, or other day back to work after several days away from your current workplace?**

**26.e. At what time of the work day does your chest feel tight or your breathing difficult?**

These questions were not tested.

**27.a. Have you ever had asthma?**

Five participants answered yes to this question. All five said that their asthma was diagnosed by a doctor.

Twenty-three participants answered no to this question. Some participants qualified their responses to this question. For example, one participant said, "Not that I've noticed. I've never been diagnosed," while another replied, "Not to my knowledge." Another participant appeared to confuse asthma, which she does not have, and bronchitis, which she does have.

Suggestion: Consider asking, "Have you ever been told by a doctor or other health professional that you have asthma?" if the objective of this question is to capture only those who have been diagnosed with asthma.

**27.b. At about what age did it start?**

This question was asked of the five participants who reported that they have ever had asthma. All of these participants indicated their age at diagnosis. Two of the participants were under the age of five when they were diagnosed. The other three participants reported that their asthma began when they were over the age of 40. Importantly, particularly for those who reported that their asthma began as an adult, there was often a lag between the symptom onset and an official diagnosis. The lag time between the onset of symptoms and official diagnosis for appeared to be between 2 and 3 years for those who developed asthma as adults. These participants often spoke about salient events in their lives when they first noticed problems related to asthma. One participant said he experienced the symptoms of asthma and allergies at the same time; for this reason, he concluded that his allergies triggered his asthma. Another participant talked about how she noticed breathing problems after an accident that she had a few years ago.

Suggestion: This question could be asked in two parts if its objective is to determine when the participant first experienced the symptoms of asthma: a) "At what age were you first diagnosed with asthma?" and b) "At what age did you first experience the symptoms of asthma?"

**27.c. Was it diagnosed by a doctor or other health professional?**

Five participants answered yes to this question. The participants appeared to understand that they are being asked about an official diagnosis from a licensed healthcare provider.



**27.d. Do you still have it?**

Four participants answered yes to this question. These participants did not appear to have difficulty understanding this question. One participant said “I don’t know,” because she had received conflicting advice from doctors. This participant was told by one doctor that she had 65% breathing capacity. She also feels short of breath at times and sometimes uses an inhaler, but is unsure if this is really for asthma. However, she had recently participated in an asthma research study and was told she did not have asthma. This participant also had problems on 27f.

Suggestion: It might be more appropriate and easier to ask whether respondents have experienced symptoms of asthma during a certain time period.

**27.e. If you no longer have it, at what age did it stop?**

This question was not tested.

**27.f. In the past 12 months, have you received medical treatment, taken medications or used an inhaler for asthma?**

One participant answered no to this question. Four other participants reported using inhalers. One of these participants reported using an inhaler, but was not sure if it is for asthma or something else. This is the same participant who had received conflicting advice from doctors in 27d.

**27.g. When you first developed symptoms of asthma, were you employed?**

One participant answered yes. This question was awkward to ask of two participants who were under the age of five when they were diagnosed.

Suggestion: The answer to 27b could be used to screen for participants who were born with asthma or developed it during childhood. Afterwards, the interviewer could proceed to ask the applicable participants about their occupations at symptom onset.

**27.h. What was the job you had when you first developed symptoms of asthma? (If you had more than one job, report the job you spent the most time doing.)**

**27.i. What did you do in that job?**

These questions were not extensively tested.

**27.j. What kind of business or industry was that job in?**

This question was not extensively tested. However, the one participant to whom this question applied was not sure how to classify his job.

Suggestion: Consider providing categories or not asking this question during the interview and coding the business or industry afterward.

**27.k. Did you experience an episode of exposure to high levels of vapors, gases, dust, or fumes shortly before you first developed symptoms of asthma?**

Three participants answered no to this question. It will be hard for some participants to know the answer to this question. For example, two participants that were diagnosed when they were under the age of five said they did not know for sure.

Suggestion: Ask this question only for respondents with onset at a certain age.

**27.1. Where did this high exposure episode occur?**

This question was not tested.

**28.a. Have you ever had hay fever? An allergy involving the nose and/or eyes.**

Twelve participants answered yes, thirteen participants answered no, and three participants were not sure how to answer this question. Several participants were unsure about the definition of hay fever—some thought of these as allergies at a certain time (spring/summer), while others thought the term referred to any allergies in the nose and eyes. Some were unsure whether they had “hay fever” without having a medical diagnosis to that effect.

Participants sometimes asked interviewers whether hay fever referred to any allergies affecting the nose and eyes, or whether they should be triggered by specific stimuli. One participant clarified that he knows that he has “allergies,” but was not sure if it was specifically called hay fever. He eventually decided to answer yes to this question. However, at least three participants who gave negative responses later said that they suffer from runny nose and sneezing when exposed to pollen or certain plants. One of these participants said the severity of these symptoms warranted taking medication such as Allegra. However, she answered no because her doctor never called her problem “hay fever.”

Another potential problem is that this question might not detect individuals with infrequent or minor problems with hay fever symptoms. One participant answered no because he rarely has the symptoms and only notices the symptoms after particularly high exposure.

Suggestion: A more concise definition of hay fever and its symptoms would be useful. The current definition is incomplete and difficult to read as written. Consider rewording to something like: "The next question is about hay fever, which is a problem people have with nose or eyes when exposed to pollen or other plants, and is usually worse in spring. Sometimes people refer to this as “having allergies.” Have you ever had hay fever?"

### **28.b. At about what age did it start?**

Participants had difficulty identifying a precise age at which they first experienced hay fever. They were more inclined to state their approximate age (e.g., "young adult at about age 21") or decade (e.g., "early 20s"). Some also stated a particular period of their lifetime (e.g., began at the time of their children's birth).

Participants also described how they sought a diagnosis when the symptoms became more severe (e.g., "started to realize it was a problem") or were occurring on a more frequent basis.

### **28.c. Was it diagnosed by a doctor or other health professional?**

Eight participants answered yes to this question. Two of them said they were diagnosed with allergies but not specifically with hay fever. Six other participants answered no to this question.

Suggestion: Consider asking whether respondents were diagnosed with either *hay fever* or *allergies*.

### **28.d. Do you still have it?**

Ten participants answered yes, one participant answered no, and one participant was not sure how to answer this question. A couple participants expressed uncertainty. For example, one participant believed he had hay fever but was unsure because he had not visited a healthcare provider for it. Another qualified his answer with "sometimes," indicating that the symptoms are not constant.

The participant who answered no indicated that he does have some symptoms in the spring. He answered no because the symptoms are "not bad."

One participant was not sure how to answer this question. This person had recently had one episode that led him to visit the doctor. However, the doctor was vague about the actual diagnosis, so he was unsure how he should answer this question.

Suggestion: It might be simpler for respondents to indicate whether or not they have had any symptoms of hay fever in the last 12 months.

### **28e. If you no longer have it, at what age did it stop?**

This question was not tested.

**28.f. In the past 12 months, have you received medical treatment, taken medications or used a nasal spray for hay fever?**

Six participants answered yes, four answered no, and one was not sure how to answer this question. Participants mentioned a variety of prescription medications and over-the-counter medications (such as Sudafed or Sine-Off). One of these participants had to think for a while before deciding to count over-the-counter medications. Another participant answered no to this question, and another was unsure how to answer, because they only used over the counter medications.

Suggestion: It would be helpful to clarify whether over the counter medications should count in the answer to this question.

**29.a. Have you ever had bronchitis?**

Fifteen participants answered yes and twelve participants answered no to the question. Two participants who answered yes said that the literal diagnosis was *chronic* bronchitis. At least two additional participants appeared to be reporting chronic bronchitis as well—probing revealed that they had long-term symptoms. As written and positioned in the questionnaire, this item will probably capture both acute and chronic cases of bronchitis.

Our participants also tended to believe that this question was only asking about serious instances of bronchitis that were diagnosed by a doctor. One participant recalled an episode when he was a child where his mother told him that he had bronchitis. However, this participant chose to answer no because it was never diagnosed. The problem also arose at 29d where participants sometimes limited reports to *diagnosed* episodes.

Suggestion: It would be useful to separate reports of acute and chronic bronchitis. One way to accomplish this would be to add an introduction explaining the difference and indicating that we will ask about both. Questions about acute and chronic bronchitis should be asked in succession (i.e., without questions about pneumonia appearing between them.)

**29.b. Was it diagnosed by a doctor or other health professional?**

All fifteen participants who said that they ever had bronchitis said that it was diagnosed by a doctor. Two of them were diagnosed with chronic bronchitis. Two other participants were unsure whether the actual diagnosis was bronchitis or chronic bronchitis, but as noted above, their symptoms seemed closer to chronic bronchitis than acute bronchitis.

**29.c. At about what age did you first have bronchitis?**

Participants had difficulty pinpointing exact ages. Some participants spoke about bronchitis in relation to other health conditions they had at the time. One remembered her first bout with bronchitis during the time she was pregnant, while another recalled his

first bout before his allergies were triggered. Another participant remembered being told by his doctor that he had a sinus infection and "a touch of bronchitis."

Several vacillated between different age ranges when estimating their age at symptom onset. For example, one participant initially said "40-44" but changed his mind and reported that it was closer to 48-49. Another participant said "I don't know, 20 years ago...maybe 10."

#### **29.d. How many times have you had bronchitis?**

The participants who had infrequent bouts with acute bronchitis were able to answer this question more easily than those who had lengthier or more frequent episodes of bronchitis. Participants who had recurrent symptoms also had more difficulty remembering the number of times. This was particularly true for participants who actually experienced *chronic* bronchitis. One of these participants said that they did not know that it was possible to get over bronchitis.

Once again, participants tended to report serious episodes that were diagnosed by a doctor. At least two participants did not include instances that they thought might have been bronchitis, but were not serious enough to cause them to visit a doctor.

Suggestion: The use of a reference period might make it easier for respondents to recall these episodes. For example, the question could be changed to, "How many times have you had bronchitis during the past five years?"

#### **30.a. Have you ever had pneumonia or bronchopneumonia?**

Fourteen participants answered yes, twelve participants answered no, and one participant answered "don't know" to this question. Several participants did not know the difference between pneumonia and bronchopneumonia, but this did not make it difficult for anyone to answer. One participant referred to bouts with walking pneumonia that occurred approximately once every other year.

#### **30.b. Was it diagnosed by a doctor or other health professional?**

This question appeared to work well as written. Thirteen participants answered yes and one participant answered no to this question.

#### **30.c. At about what age did you first have pneumonia or bronchopneumonia?**

This experience seemed pretty memorable for most of the participants who had experienced it. Several participants qualified their answer with a particular life event (e.g., taking a college course) or illness severity (i.e., illness severity that warranted missing work for a week) to help them remember the age that they first experienced the disease. Only one participant had difficulty answering, as she had several incidents of walking pneumonia and the first one did not stand out in her mind.

**30.d. How many times have you had pneumonia or bronchopneumonia?**

In general, participants were easily able to recall the number of times they had pneumonia. However, the participant who experienced walking pneumonia could only say that it happened about once every other year.

**31.a. Have you ever had chronic bronchitis?**

Twenty-one participants answered no to this question, three answered yes, and three others were not sure how to answer. As noted earlier, some participants had already reported chronic bronchitis in response to the earlier question about bronchitis.

Another problem was that some participants were uncertain as to what qualified as chronic bronchitis. Some thought that chronic meant severe or life threatening, whereas others thought that it meant recurring or continual. A few participants admitted that they were not sure about the difference between bronchitis and chronic bronchitis. One of these participants had one major incident with bronchitis during his lifetime and might have had another minor incident at some point in his life—he thought that might qualify as chronic bronchitis, but was unsure. Another participant described recurring symptoms that required monitoring over a five year period. These symptoms seem to be consistent with chronic bronchitis, but the participant was uncertain about the diagnosis and unable to provide an answer to this question. One participant who was unsure how to answer this question leaned toward answering yes because she had a case of bronchitis that took approximately six months to clear up.

Suggestion: As suggested earlier, consider asking questions about bronchitis and chronic bronchitis in succession, and provide definitions that will help respondents distinguish between the two.

**31.b. Was it diagnosed by a doctor or other health professional?**

This question was administered to three participants, all of whom answered yes.

**31.c. At about what age did it start?**

Two participants answered this question. One participant said she was 23 years old (when she was pregnant) when symptoms started. Another estimated that his symptoms began "about 5 years ago."

**31.d. Do you still have it?**

One participant answered yes, and one participant answered no. This question was challenging for a participant who did not have follow up visits with her doctor. She recalled having been diagnosed some 20 years ago, but claimed to not currently have symptoms. However, the same participant also believed that she was never fully cured of

chronic bronchitis and she was unsure as to whether her coughs were linked with chronic bronchitis.

Suggestion: It might be useful to ask respondents if they experienced symptoms within a particular reference period (e.g., “Have you experienced symptoms of chronic bronchitis within the past 12 months?”)

**31.e. In the past 12 months, have you received medical treatment, taken medications or used an inhaler for chronic bronchitis?**

Two participants answered this question. One participant said he took medications and used an inhaler to alleviate his symptoms; the other said he took medications and used a nebulizer.

**32.a. Have you ever had emphysema?**

One participant answered yes and twenty-two participants answered no to this question. The yes response was from a smoker who developed emphysema about ten years ago. A few other participants specifically associated emphysema with smoking. After one of the no responses, a participant added, "as far as I know" indicating that he thought this was serious enough that someone would know if they had it.

**32.b. Was it diagnosed by a doctor or other health professional?**

This question was not explicitly tested—one participant reported being diagnosed while responding to the previous question.

**32.c. At about what age did it start?**

The participant reported developing emphysema ten years ago.

**32.d. Do you still have it?**

**32.e. In the past 12 months, have you received medical treatment, taken medications or used an inhaler for emphysema?**

These questions were not tested.

**33.a. Have you ever had COPD (chronic obstructive pulmonary disease)?**

Three participants answered yes. One participant added that his COPD symptoms were similar to that of asthma, including feelings of tightness in the chest.

Twenty-three participants answered no. Some of the participants who answered no also mentioned that they had never heard of COPD, but they were sure that they did not have

it. One participant, who reported that he has heard of COPD, asked if this condition was caused by exposure to asbestosis or silicosis.

**33.b. Was it diagnosed by a doctor or other health professional?**

All three participants who said that they have COPD also said that it was diagnosed by a doctor.

**33.c. At about what age did it start?**

All three participants, to whom this question applied, easily reported their age at diagnosis.

**33.d. Do you still have it?**

Two participants answered yes and one participant answered no to this question. One participant who answered no to this question said she was diagnosed with COPD within the past two years. However, she claimed that her symptoms abated after she reduced her smoking and began using Ambuterol.

Suggestion: It might be more specific to ask whether respondents have had symptoms of COPD, or received treatment for COPD, during a certain reference period.

**33.e. In the past 12 months, have you received medical treatment, taken medications or used an inhaler for COPD?**

All three participants who said that they had COPD also said they had taken medication for it within the past 12 months. One participant mentioned the use of Ambuterol.

**34.a. Have you ever had sleep apnea?**

Five participants answered yes. One participant answered yes only because friends have told him that his sleep patterns may reflect symptoms sleep apnea. Another participant claimed to have sleep apnea, but responses to probes suggested that she actually has insomnia. She may have misunderstood.

Sixteen participants answered no. Most had some idea of what sleep apnea was and were pretty confident that it did not apply to them. However, two participants said they experienced symptoms of sleep apnea but were never officially diagnosed with it. Another participant believed that sleep apnea was a disorder characterized by unpredictable and uncontrollable bouts of deep sleepiness. He added that this condition also caused one's heart to stop beating during sleep. He questioned the relevance of sleep apnea in a questionnaire about respiratory health.

Two participants did not know how to answer this question. One participant said, "What is that? I've had some problems sleeping but I don't know what sleep apnea is. I don't



think I have it." He also spoke about taking sleep-aid medications. Another participant said "Not sure" but he claimed to have had symptoms and said his symptoms have prevented him from sleeping restfully.

Suggestion: Consider adding a definition of sleep apnea with the question.

**34.b. Was it diagnosed by a doctor or other health professional?**

Two participants answered yes. One participant who answered no was told by a friend (a nurse) that he probably had sleep apnea, but this was never officially diagnosed.

**34.c. At about what age did it start?**

One participant gave the exact age at diagnosis, but also indicated that the symptoms started a few years before the diagnosis. Another participant recalled when his snoring symptoms began, but this was difficult for him to recall. A third subject said that the symptoms began when he was in his thirties.

Suggestion: If the intent of the question is to ask when symptoms began, it would be better to ask, "How old were you when you first had symptoms of sleep apnea?"

**34.d. Do you still have it?**

One participant answered yes. Another participant answered no because he had recently had surgery to fix this condition and now wears a snore guard.

**34.e. In the past 12 months, have you received any treatments for sleep apnea?**

One participant said that he had never been offered treatment.

**35.a. Have you ever had pulmonary fibrosis, IPF, or pneumoconiosis?**

One participant answered yes. This participant said he had asbestosis, which he believed was a form of pneumoconiosis. He further explained that pneumoconiosis is scarring of the lungs due to pneumonia, and asbestosis is scarring of the lungs due to asbestos.

Twenty participants answered no. Five of them said "no" because they were not familiar with any of these three illnesses. For example, a participant replied, "If I'd had it, I would have remembered that." Several other participants reported that they have heard about these illnesses but were confident they never had them. The others have heard about pulmonary fibrosis but not about IPF or pneumoconiosis.

One participant was unsure, asking "is that pneumonia? If that's pneumonia then yes, but otherwise I don't know."

Suggestion: Provide definitions to respondents who are unsure or ask for more details about these diseases.

**35.b. Was it diagnosed by a doctor or other health professional?**

This question was not extensively tested. One participant responded to this question by reporting that his medical test results revealed a difference between pneumoconiosis and asbestosis.

**35.c. At about what age did it start?**

One participant was diagnosed with asbestosis at age 42.

**35.d. Do you still have it?**

One participant answered yes to this question.

**35.e. In the past 12 months, have you received any treatment for pulmonary fibrosis, IPF, or pneumoconiosis?**

One participant answered no to this question.

**35.f. Was your pulmonary fibrosis, IPF, or pneumoconiosis confirmed by a chest x-ray or CT scan?**

One participant answered yes to this question.

**35.g. Was the cause known?**

One participant answered yes to this question.

**35.h. Please specify the cause:**

One participant said that exposure to asbestosis was the cause.

**36. Have you ever had:**

**36a. Any other chest illness?**

This series was administered to 22 participants. Two participants answered yes to this question. One participant who answered yes was thinking specifically about a cold. The other participant who answered yes was thinking about a more serious condition involving inflammation of the lungs.

Some other participants expressed uncertainty as to whether colds should be included in the answer to this question.

Suggestion: Include wording to make it clear if ordinary chest colds should not count.

**36.b. Any chest operations?**

Twenty-two participants answered no this question.

**36.c. Any chest injuries?**

Six participants reported broken ribs in response to this question.

**37.a. Has a doctor or other health professional ever told you that you had coronary artery disease, angina, heart attack, or myocardial infarction? Please answer ‘yes’ if you have had coronary artery bypass graft surgery, coronary angioplasty, or a coronary stent procedure.**

This question was administered to 16 participants. Only one participant answered yes—he was told that he had heart disease. The other 15 participants answered no to this question. It was difficult to read both sentences of this question, because the participants often interrupted before the second sentence was read.

Suggestion: Re-phrase the question to something like: “Has a doctor or other health professional ever told you that you had any of the following: [read the list.] Alternatively, consider decomposing this into several questions so that the respondents are more likely to listen to all the conditions being asked about.

**37.b. In the past 12 months, have you received any medical treatment for this condition?**

One participant reported taking blood pressure pills.

**38.a. Has a doctor or other health professional ever told you that you had heart failure or congestive heart failure?**

This question was administered to 14 participants, all of whom answered no.

**38.b. In the past 12 months, have you received any medical treatment for this condition?**

This question was not tested.

**39.a. Has a doctor or other health professional ever told you that you had high blood pressure?**

This question was administered to 15 participants-- eight participants answered yes and seven participants answered no.

**39.b. In the past 12 months, have you received any medical treatment for high blood pressure?**

Five participants answered yes to this question. All of these participants were taking medication for high blood pressure. Two of these participants also mentioned changes in diet and exercise. However, one other participant, who answered no to this question, mentioned that he was told by a doctor to change his diet five years ago.

**40.a. Has a doctor or other health professional ever told you that you had diabetes?**

One participant answered yes and 14 participants answered no to this question.

**40.b. In the past 12 months, have you received any medical treatment for diabetes?**

One participant takes an injection twice per day.

**41.a. Has a doctor or other health professional ever told you that you had a high cholesterol or high triglyceride level?**

Eight participants answered yes and seven participants answered no to this question. One of the participants who answered yes has a normal overall level of cholesterol, but a high triglyceride level. One participant who answered no was not sure if he had ever been tested.

Suggestion: Consider simply asking about high cholesterol. If it is necessary to ask about triglycerides, consider asking a separate question.

**41.b. In the past 12 months, have you received any medical treatment for this condition?**

Two participants answered yes (they take medication) and four participants answered no to this question. Two of the participants who answered no did mention changing their diets as a result of their cholesterol.

**42.a. Has a doctor or other health professional ever told you that you had a stroke or peripheral vascular disease (arterial circulation problems)?**

Fourteen participants answered no to this question.

**42.b. In the past 12 months, have you received any medical treatment for this condition?**

This question was not tested.

### **43. What is your height?**

This question appeared to be easy for participants to answer.

### **44. What is your weight?**

This question also appeared to be easy for participants to answer.

### **45.a. Have you ever smoked cigarettes? No means less than 20 packs of cigarettes or 12 oz. of tobacco in your lifetime or less than 1 cigarette a day for one year at any time in your life.**

Seventeen participants answered yes and ten participants answered no to this question. The second sentence was very confusing to most participants. It is very difficult to impose a definition of what “no” means that is contradictory to a straightforward interpretation of the original question. The interviewer was often interrupted during its presentation or it was clear the participant did not pay any attention to it.

The discrepancy between the core question and the definition poses a problem when someone has been an occasional smoker—if they fail to listen to and comprehend the definition, very occasional smokers will still answer “yes.” For example, one participant answered yes to this question even though he had experimented with cigarette smoking only one time. This response made the next questions seem awkward.

Suggestion: If the intent of the question is to determine whether someone has reached a certain threshold of smoking (e.g., 20 packs) then it would be more effective to ask that directly. The question could be worded as follows: “Have you smoked more than 20 packs of cigarettes in your lifetime?” As an alternative, consider using an initial screener question could be used to determine whether someone smoked at all. For example: “Have you *ever* smoked cigarettes?” [IF YES], “In your lifetime, have you smoked more than 20 packs of cigarettes?”

Also, while the alternative measure “ounces of tobacco” could be useful to some respondents, it probably makes the question unnecessarily complicated for most. Consider providing this only for those (probably rare) respondents who are unable to answer the question based on packs.

### **45.b. How old were you when you first started regular cigarette smoking?**

This question was administered to seventeen participants. The question assumes that the respondent has been a “regular” cigarette smoker; this is a false assumption for irregular, occasional, or “social” smokers, some of whom could still have reached the 20-pack threshold. For example, one participant rejected the premise of the question by saying, “I didn’t actually really regularly smoke cigarettes.” This participant thought he had smoked about 20 packs in his lifetime, but contrasted “social” smoking with “regular” smoking.

There was also variation in the interpretation of what constituted “regular” cigarette smoking. One participant thought that term “regular” cigarette smoking applied when he began purchasing his own cigarettes. Two other participants thought regular cigarette smoking was defined by the amount of cigarettes that were smoked per day. For example, one participant thought that regular meant about ten cigarettes per day, whereas another thought regular meant about one pack per day. One participant completely missed the reference to regular cigarette smoking in the question and referred to a time when he was five years old and tried one of his father’s cigarettes.

Suggestion: Determine a threshold for “regular” cigarette smoking. First, ask if respondents have ever smoked that much, and then ask at what age they started doing so.

**45.c. Do you now smoke cigarettes as of one month ago?**

Seven participants answered yes and eight participants answered no to this question. Participants were generally able to answer, but we note a few possible problems.

First, the question says both “now” and “as of one month ago.” Although the answer was the same either way for most participants, this is potentially contradictory, as well as grammatically odd. Second, it is not clear if this question is asking about regular cigarette smoking, as implied by the previous question, or if it is asking about any cigarette use at all during the past month. One participant reported only smoking occasionally and was unsure how to respond. Another participant answered no, but admitted smoking on rare occasions or about 10 cigarettes in the past year.

Suggestion: Ask something more specific and less ambiguous, such as “Have you smoked more than one pack of cigarettes in the past month?” Of course, the specific threshold should be adjusted based on specific research objectives.

**45.d. How many cigarettes do you smoke per day now?**

Answers ranged from 3 to 20 or more per day. We did not observe any problems with the question. Note that this question could potentially function as a screener question instead of 45.c (i.e., a response of “zero” is the same as “no” to 45c).

**45.e. Did you ever quit smoking for 6 months or longer?**

This question was administered to seven participants, and we did not observe any problems.

**45.f. For how many years in total did you quit smoking?**

This question was administered to five participants. The answers varied from 1.5 to 10 years. We did not observe any explicit problems, although participants were clearly providing rough estimates.

**45.g. How old were you when you completely stopped smoking?**

This question was administered to five participants. The question incorrectly assumes that the respondent has completely stopped smoking. For example, although one participant indicated at Q45c that he does not currently smoke, this did not mean that he *never* has a cigarette.

Another problem is that some respondents who weaned themselves off, or who are in the process of doing so, might have a difficult time answering. For example, one participant had quit smoking many years ago, but said that he would have had a difficult time answering this question around the time that he was cutting back.

Suggestion: Ask respondents to report last time they have smoked *any* cigarettes. This avoids the issue of whether or not they have “completely” stopped.

**45.h. When you were a smoker, did you ever quit smoking for 6 months or longer before you completely stopped smoking?**

This question was administered to six participants. As noted above, there were sometimes difficulties determining when or if someone has “completely stopped smoking.”

At least one participant seemed to misunderstand the question—his “yes” response seemed to mean that it took him longer than six months to finally quit smoking.

Suggestion: Ask respondents whether they have ever “quit smoking for 6 months or longer.”

**45.i. During the time that you were a smoker, for how many years in total did you quit smoking?**

This question was only administered to three participants. All three of these participants had some difficulty answering this question. One participant, who smoked “socially” smoker throughout his life, never really considered himself to be a smoker, so it was difficult to quantify smoking and non-smoking times. Another participant had been a heavier smoker when he was younger, but has only been an occasional smoker for the past several years. He said no to 45c, classifying himself as a non-smoker, but at this question admitted that he will occasionally purchase a pack and smoke one or two cigarettes. Another participant was referring to the six months that it took to quit cigarette smoking.

Suggestion: For 45h and 45i, replace “you were a smoker” with “you smoked.” The term “smoker” is more subjective (people might smoke without considering themselves to be “smokers.”) This could be a particular problem for those who smoke occasionally

or intermittently. It might also be helpful to offer broad ranges (e.g. less than a year, 1-2 years, more than 2 years, or whatever other units are analytically appropriate).

**45.j. On the average of the entire time you smoked, how many cigarettes did you smoke per day?**

This question was administered to twelve participants. Two of the participants needed to have the question repeated in order to provide an adequate response. However, most participants were able to provide an average that described their smoking behavior.

Suggestion: Consider offering response categories to respondents (e.g., less than 10, between 10 and 20, etc.)—this might help respondents with a lot of variability to find a general response that makes sense to them.

**Note:** Many of the remaining smoking questions were not extensively tested, but some of the recommendations provided for the cigarette questions could be applied here as well.

**46.a. Have you ever smoked a pipe regularly? (Yes means more than 12 oz. of tobacco in a lifetime.)**

One participant answered yes and sixteen participants answered no to this question. The participant who answered yes to this question was actually referring to the use of a pipe to smoke marijuana. Another participant needed clarification that this question was not referring to the use of marijuana in a pipe.

Suggestion: Clarify that this question is referring to tobacco. Also, consider asking a screening question first (“ever used a pipe to smoke tobacco?”)—most will answer no, but for the test, an additional question could be used to determine whether this was isolated or regular usage.

**46.b. How old were you when you first started to smoke a pipe regularly?**

**46.c. Do you now smoke a pipe (as of one month ago?)**

**46.d. How much pipe tobacco do you smoke per week now?**

**46.e. Did you ever quit smoking a pipe for 6 months or longer?**

**46.f. For how many years in total did you quit smoking?**

**46.g. How old were you when you completely stopped smoking a pipe?**

**46.h. When you were a pipe smoker, did you ever quit smoking for 6 months or longer before you completely stopped smoking?**



**46.i. During the time that you were a pipe smoker, for how many years in total did you quit smoking a pipe?**

**46.j. On the average of the entire time you smoked a pipe, how many ounces of tobacco did you smoke per week?**

These questions were not tested.

**47.a. Have you ever smoked cigars regularly? (Yes means more than 1 cigar a week for one year at any time in your life.)**

One participant answered yes and sixteen participants answered no to this question. The yes response was from a participant who smokes one cigar per day. Another participant smoked cigars periodically and needed clarification to determine whether this qualified as “regularly.” However, it would have been clearer to define the word “regularly” rather than defining what “yes” means. This participant said that he may have smoked 1 cigar per week over a period of 3 months, but it had been a couple months since any use of cigars at all.

Suggestion: See comments for 45a about the use of definitions such as “no means...” It is better to ask directly about the level of behavior we are looking for than to provide definitions that may be contradictory. One option would be to ask “Have you ever smoked at least one cigar per week for a whole year or longer?” A more general screening question would be easier for respondents, such as “Have you smoked twenty or more cigars in your entire lifetime?”

**47.b. How old were you when you first started to smoke cigars regularly?**

One participant answered this question without difficulty.

**47.c. Do you now smoke cigars (as of one month ago?)**

One participant answered yes to this question. Note the comment above (Q45c) about the use of “now” and “as of one month ago” in the same question.

**47.d. How many cigars do you smoke per week now?**

One participant answered seven cigars per week. This participant mentioned that he does quit smoking for Lent every year, but did not feel that this would change his overall answer.

**47.e. Did you ever quit smoking for 6 months or longer?**

One participant answered no to this question.

Suggestion: Change the wording to “Did you ever quit smoking cigars for 6 months or longer?” to avoid confusion about whether this question is referring to cigar use or other tobacco use.

**47.f. For how many years in total did you quit smoking?**

**47.g. How old were you when you completely stopped smoking cigars?**

**47.h. When you were a smoker, did you ever quit smoking for 6 months or longer before you completely stopped smoking?**

**47.i. During the time that you were a smoker, for how many years in total did you quit smoking?**

These questions were not tested.

**47.j. On the average of the entire time you smoked, how many cigars did you smoke per week?**

One participant answered seven days per week. This participant mentioned that he does quit smoking for Lent every year, but did not feel that this would change his overall answer.

**48.a. In your childhood, did you live with a regular cigarette smoker who smoked in your home?**

**48.b. Did your Mother smoke in the home**

**48.c. Did your Father smoke in the home**

**48.d. Did other household members smoke in the home**

**48.e. If YES to Others: How many others?**

Fourteen participants answered yes and seven participants answered no to 48a. The participants who answered yes easily identified the individuals who smoked in the home. One participant had lived with grandparents who smoked for one year during his childhood, but he answered no to this question because this was not an unusual year in his life.

**49.a. As an adult, have you ever lived with a regular cigarette smoker (not including yourself) who smoked in your home?**

Twelve participants answered yes and nine participants answered no to this question. It was unclear for some participants what is meant by “your home.” For example, this question can be confusing if someone was a young adult when they lived at home with their parents who smoked. One participant who had already reported that his parents smoked in the home when he was a child asked for clarification about whether this referred to his own home or his parents. This participant had also lived with his parents

as a young adult for a couple of years and was not sure about whether he should report this again.

Note also that the term “regular cigarette smoker” is vague. The participants in this study did not seem to have any particular trouble with the term, but it could be ambiguous for some respondents.

Suggestion: Modify the final clause to “who smoked indoors where you lived.” Consider this modification in subsequent questions below. Also, consider providing a definition of “regular.”

**49.b. As an adult, for how many total years did you live with a regular cigarette smoker who smoked in your home?**

This question was administered to ten participants. One participant who lived in various living arrangements found it hard to answer this question. Another participant had lived with a regular cigarette smoker for three weeks as an adult and was not sure how to answer this question.

**49.c. In the past 12 months have you lived with a regular cigarette smoker who smoked in your home?**

One participant answered yes and seven participants answered no to this question. The participant who answered yes was referring to his wife who occasionally smoked on weekends. However, probing revealed that she did not actually smoke in the home.

**49.d. In the past 12 months, for how many hours per day on average are you at home while someone other than yourself is smoking there?**

This question was not tested.

**50.a. In the past 12 months, when you are not at home, do you regularly spend time indoors where there are people who are smoking cigarettes?**

Three participants answered yes and fifteen participants answered no to this question. Yes responses reflected both social and work situations. We did not observe any problems with the responses to this question.

**50.b. As an adult, for how many total years have you spent time, when you are not at home, indoors where there are people smoking cigarettes?**

This question was administered to three participants. Answers included “all my adult life,” “about 20 I guess,” and “about 23 years.” These responses generally reflected their entire adult lives.

Although participants were able to answer, we think the question is potentially confusing because it asks respondents to count years in “all or nothing” terms. That is, if a respondent spends any time around smokers indoors in a given year, they should presumably count that as a year. However, it also seems clear that levels of exposure to indoor smoke are decreasing for most people over time. Twenty years ago, exposure to indoor smoke might have been more or less constant, whereas now there might be limited smoking allowed in some parts of the work environment. The question does not allow respondents to make such distinctions, which could make response judgments difficult.

Also, if kept, the question is grammatically complex (“when you are not at home, indoors where there are people smoking”) and should be simplified.

Suggestion: Consider dropping this question. We suspect that if people understand it, they will generally give responses that mean “all or most of my adult life.” We are not sure this will provide much of value, especially given its complexity.

**50.c. In the past 12 months, how many hours per week on average do you spend in a place where people are smoking?**

This question was only administered to two participants. One participant, who answered “40 or more,” was exposed most of the time at work. Another participant answered five hours per week because he was usually exposed for about one hour per day at work.

**51. How many rooms (not counting bathrooms) are there in your house/apartment?**

This question was administered to eighteen participants. Most participants answered this question easily. However, one participant asked if the garage should count and finally decided that it should not.

**52. How many people live in your home?**

This question was administered to eighteen participants. It seemed to work most of the time, although it was a bit complicated for participants with roommates and those living in transient living situations.

**53. What kind of stove do you mostly use for cooking?**

Eight participants answered electric and ten participants answered gas. All participants who answered gas needed to be probed to determine whether they had a gas stove with an electric starter or constant pilot. Some participants were unsure about how to include their use of other cooking equipment such as grills and microwaves in their answer.

Suggestion: A follow-up question is needed for those who have gas stoves in order to determine whether the stove has an electric starter or constant pilot.

**54. During the last 12 months has there been any flooding or water damage in your home?**

Two participants answered yes to this question. One of these participants had a pipe had burst in the bathroom. The other participant had a sump pump freeze in his house, which left about an inch of standing water on the floor. Fifteen other participants answered no to this question.

**55. During the last 12 months have you noted any mold or mildew on any surface, other than food, inside your home?**

Sixteen participants answered no to this question.

**56.a-c Do you currently have any of the following pets living in your home?**

**56.a. Cat**

**56.b. Dog**

**56.c. Other furry pets**

This series was administered to sixteen participants, and worked fine as worded. Hedgehogs and hamsters were included as “other furry pets.”

**57.a-c. In the last 12 months have you noted any of the following pests in your home?**

**57.a. Cockroaches**

**57.b. Mice**

**57.c. Rats**

This series was administered to fifteen participants. One participant found rats in a detached garage, but answered no to this question. Another participant answered yes to mice because the cat caught one, but the participant was not sure if this actually was from the house or outdoors.

**62.a. Have you ever been exposed at work to vapors, gas, dust or fumes? If yes, when did it happen?**

This question was administered to fourteen participants. The wording of the first question suggests that it might only apply to the respondent’s current job. A more specific wording might help.

The second question seems to ask for a time period, but the answer categories capture information about which job this occurred on. It is not clear how someone should answer until the response categories are read. Also, it was common for participants to report that exposure occurred on multiple jobs rather than any particular job.

Suggestion: For the first question, restructure slightly: “Have you ever been exposed to vapors, gas, dust, or fumes at any job you have had?” If the participant answers yes, ask

respondent to report which jobs this happened on, preferably by referring to jobs listed in the work history questionnaire.

**63.a-h. Were either of your natural (biologic) parents ever told by a doctor or other health professional that they had any of the following conditions?**

**63.a. Chronic Bronchitis**

**63.b. Emphysema**

**63.c. Chronic Obstructive Pulmonary Disease (COPD)**

**63.d. Asthma**

**63.e. Hay fever (allergy involving the nose and/or eyes)?**

**63.f. Lung Cancer**

**63.g. Sleep Apnea**

**63.h. Other lung diseases**

This series was administered to sixteen participants. Participants commonly indicated that they did not know the answers to one or more items on this list, often answering along the lines of “not as far as I know.” In addition, participants were sometimes unsure about the actual diagnoses of their parents. They were also unfamiliar with some of the conditions in the question. Also, at least one participant never knew his natural father and so he could not answer these questions about him. Another participant said that she did not know her mother very well because she died when the participant was very young.

Suggestion: Reword slightly to ask “as far as you know...”

**64. Did or does your natural (biologic) parent ever smoke cigarettes?**

This question was administered to fourteen participants. Most participants had no difficulty providing an answer. One participant has never known his natural father and so he could not answer the question about him.

Suggestion: Re-word slightly to ask two separate questions, one about each parent. Remove the parenthetical “biologic” but provide respondents with a more specific definition if needed. Also, move this question after Q65, so it will be clear whether the parent in question is still alive or not.

**65. Is your natural (biologic) parent currently alive?**

This question was administered to twelve participants. Most participants had no difficulty providing an answer. One participant has never known his natural father and so he could not answer the question about his father.

Suggestion: Re-word so this actually appears as two scripted questions, one about each parent.

**66. Please specify age:**

This question was administered to eight participants. No problems were observed during testing.

Suggestion: Script the questions exactly as they should be read.

**67. Please specify cause of death:**

This question was administered to four participants. It is sometimes difficult for the participants to provide the exact cause of death. One participant did not know how his father died because no autopsy was performed. Another participant said that his mother died from “some health condition,” but could not specify the condition. A third participant had a parent who died from multiple forms of cancer.

Suggestion: This was a rather “down” way to end the interview. Consider ending the questionnaire with different questions. One possibility would be to ask the Q63 series last.

*Instructions for a face-to-face or telephone interview:*

**Interviewer:** You will cycle through the following Questions/table for each job the subject has had for 6 continuous months or longer beginning with the first regular job they held and work forward to their current or most recent job. Also include part-time positions (part-time is 20 to 29 hours per week; full-time is 30 or more hours per week; do not record any job in which the subject worked less than 20 hours per week on average). Follow the script below to obtain the information.

A. Are you currently working in a full- or part-time job?    \_\_\_Yes    \_\_\_No

**If Yes, Continue with questions below.**

**If No, A1.** Have you ever worked for at least 6 months at a job?    \_\_\_ Yes    \_\_\_ No

**If Yes, Continue with questions below.**

**If No, Skip questions below.**

Now I would like to ask you some questions about your work history. For the following questions only include jobs that you held for 6 months or more. Include part-time jobs where you worked 20 hours or more per week. Let's start with the *first* regular job you held:

B. What was your job title?

C. Please describe what you (do/did) on this job?

**D. Occupation code—usually added after interview. See Q by Q Objectives below.**

E. What (is/was) the average number of hours you work(ed) per week?

F. What (is/was) the name of the company (business/industry)?

G. Describe what the company, business, or industry (does/did). What (is/was) the main product or service?

**H. [Industry code—usually added after interview. See Q by Q Objectives below.]**

I. What month and year did you start this job?

J. What month and year did you end this job? **[If current job, record current month and year]**

Now I'd like you to tell me about the job you had after that one, which lasted for 6 months or more.



Probe about gaps in the sequence. What do people do if they held more than one position in the same company? What if someone hasn't worked in their current job for six months or more?

Probe how they remembered and whether it was easy or difficult to remember details?

Repeat for each job that lasted 6 months or longer.

**ID Number:** \_\_\_\_\_

Job No.	B. Job Title	C. Job Description (everyday duties, tasks)	D. Occup. Code	E. Avg. hours work/week	F. Company Name	G. Description of Business or Industry	H. Indust. Code	I. Start Date		J. End Date	
								Mo.	Year	Mo.	Year
1											
2											
3											
4											

## **QUESTION-BY-QUESTION OBJECTIVES AND INSTRUCTIONS**

### **Definitions:**

Part-time job = On average, work 20 to 29 hours per week.

Full-time job = On average, work  $\geq 30$  hours per week.

QA. Are you currently working in a full- or part-time job?

If the respondent is currently working proceed with QB-QJ.

If the respondent is not currently working ask QA1.

### **QA1. Have you ever worked for at least 6 months at a job?**

If the respondent has worked for at least 6 months at a job in the past then continue with QB-QJ.

If the respondent has never worked, skip the work history-related questions.

### **QB. What was your job title?**

If a subject has changed departments within the company but the job title and tasks have remained the same do not enter a new job.

For example if a nurse within a hospital changes departments but the title and tasks have not changed consider this the same job.

If the respondent has had more than one job title while working at the company named, repeat QB-QJ for each separate job title in the order in which the jobs occurred.

If the subject has had more than one job at a time, each job should be listed separately such that QB-QJ are answered for each job.

### **QC. Please describe what you (do/did) on this job?**

Determine the respondent's particular duties or tasks when he/she worked at each job title. Enter all the duties and tasks provided by the respondent. If the respondent does not indicate specific duties or tasks probe using appropriate examples.

**QD. Occupation code**

Options:

- 1) The interviewer could work with the respondent to assign a particular occupation code to the job (although this may take too much time during the interview); OR
- 2) The job title and description could be reviewed later and then assigned an occupation code.

**QE. What (is/was) the average number of hours you work(ed) per week?**

Determine the average number of hours per week the respondent worked at each of the jobs listed.

**QF. What (is/was) the name of the company (business/industry)?**

In situations when the “company” the respondent worked for had no real name, for example a family farm, enter “family farm” or “Mr. Smith’s Farm”

**QG. What type of business or industry (is/was) that job in?**

Ask the respondent to describe what the company does and/or manufactures. What are the company’s main products and/or services?

**QH. Industry code**

Options:

- 1) The interviewer could work with the respondent to assign a particular industry code to the company job (although this may take too much time during the interview); OR
- 2) The company name and description could be reviewed later and then assigned an industry code.

**QI. What month and year did you start this job?**

Determine the month and year the respondent first started working in the job title from Q1 at the company named in Q4.

**QJ. What month and year did you end this job? [If current job, enter current month and year]**

Determine the month and year the respondent stopped working in the job title from Q1 and at the company named in Q4. If the respondent is still working at this job then enter the current month and year.

## Cognitive Interview Protocol

### Introduction:

*We are working on some questions that will eventually be added to national health surveys. Before that happens, we test them out on people like you.*

*The way this will work is this. I have a questionnaire in front of me with questions on a lot of different topics. I'm going to go through and read each question to you, and I'd like you to answer as best you can. After some of the questions, I will ask you follow up questions—I might ask you to explain your answer in more detail; I might also ask questions such as "how did you come up with your answer" "how did you remember that," or "what did it sound like the question meant to you."*

*What I'm trying to figure out is how well the questions are working. These questions are basically rough drafts. So at any time, you should feel free to let me know if:*

*there are words you don't understand,  
the question doesn't make sense to you,  
you could interpret it more than one way,  
or if the answer you are looking for is not provided.*

*Many of the questions are very simple, but some are more complicated. Don't worry about criticizing them—we are trying to find out any problems people have with them. The more you can tell us, the more information we'll have to make the questions better. Do you have any questions before we start?*

*Interviewer: As a general strategy, try to get through each question (e.g. Q6, parts "a" through "h") before probing in detail. However, you should feel free to ask non-invasive probes at any point (e.g., if a participant is obviously struggling, you can ask them to explain what they are thinking about immediately).*

*At the end of each question-series, it might often be useful to ask the participant to describe the symptoms in his/her own words and evaluate how well that lines up with responses to the question.*

*Another issue worth exploring is perceived irrelevance/inappropriateness of some questions. For example, if a participant says no to Q6a, we still ask them Q6c. Please make note if any participant seems to think that the question doesn't make sense for them.*

## **Part 2. Respiratory Symptoms**

The following questions are about respiratory or chest symptoms. If you are in doubt whether the answer is *yes* or *no*, answer *no*.

**6.a. Do you usually have a cough? Exclude clearing of throat.**

- Yes →  
 No



**6.b. Do you usually cough as much as 4 times a day, 4 or more days out of the week?**

- Yes    No

**6.c. Do you usually cough at all on getting up, or first thing in the morning?**

- Yes  
 No

**6.d. Do you usually cough at all during the rest of the day or at night?**

- Yes  
 No

**If 'Yes' to any of above (6a, b, c, or d), answer the following:**

**6.e. Do you usually cough like this on most days, for 3 consecutive months or more**

**during the year?**

- Yes  
 No

**6.f. For how many years have you had this cough?**

Number of years \_\_\_\_\_

**6.g. In the past 12 months, have you had episodes of severe cough?**

- Yes  
 No [*Skip to question 7*]

**6.h. In the past 12 months, about how many days have you had episodes of severe cough?**

- 1-7 days  
 8-30 days  
 31 or more days  
 Don't know

**7.a. Do you usually bring up phlegm from your chest?**

- Yes →  
 No

**7.b. Do you usually bring up phlegm like this as much as twice a day, 4 or more days out of the week?**

Yes    No

**7.c. Do you usually bring up phlegm from your chest on getting up, or first thing in the morning?**

- Yes  
 No

**7.d. Do you usually bring up phlegm from your chest during the rest of the day or at night?**

- Yes  
 No

**If 'Yes' to any of above (7a, b, c, or d), answer the following:**

**7.e. Do you bring up phlegm like this on most days for 3 consecutive months or more during the year?**

- Yes  
 No

**7.f. For how many years have you had trouble with phlegm?**

Number of years \_\_\_\_\_

**8.a. In the past 12 months, have you had periods or episodes of cough with phlegm that lasted 1 week or more? If you usually have cough and phlegm, please count only periods or episodes of *increased* cough and phlegm.**

- Yes →
- No

**8.b. About how many such episodes have you had in the past 12 months?**  
Number of episodes \_\_\_\_\_

**8.c. For how many years have you had at least 1 such episode per year?**  
Number of years \_\_\_\_\_

**9.a. Have you ever had wheezing or whistling in your chest?**

- Yes →
- No

**9.b. About how old were you when you first had wheezing or whistling in your chest?**  
Age in years (answer "1" if younger than age 1 year) \_\_\_\_  
Don't know \_\_\_\_

**Skip to 12**

**10.a. Have you ever had an attack of wheezing or whistling in your chest that made you feel short of breath?**

- Yes →
- No

**10.b. About how old were you when you had your first such attack?**  
Age in years (answer "1" if younger than age 1 year) \_\_\_\_  
Don't know \_\_\_\_

**10.c. Have you had 2 or more such attacks?**  
Yes                      No                      Don't know

**10.d. Have you ever required medicine or treatment for such attacks?**  
Yes                      No                      Don't know

**11.a. In the last 12 months, have you had wheezing or whistling in your chest at any time?**

- Yes →  
 No



**In the last 12 months, does your chest ever sound wheezy or whistling ...**

**11.b. When you have a cold?**  Yes  No

**11.c. Occasionally apart from colds?**  Yes  No

**11.d. More than once a week?**  Yes  No

**11.e. Most days and nights?**  Yes  No

**12.a. In the last 12 months, have you been awakened from sleep by coughing, apart from a cough associated with a cold or chest infection?**

- Yes  No [Skip to 13]

**12.b. About how old were you when you were first awakened from sleep by coughing, apart from coughing associated with a cold or chest infection?**

Age in years (answer "1" if younger than age 1 year) \_\_\_\_\_

Don't know \_\_\_\_\_

**13.a. In the last 12 months, have you been awakened from sleep by shortness of breath or a feeling of tightness in your chest?**

- Yes  
 No [Skip to 14]

**13.b. About how old were you when you were first awakened from sleep by shortness of breath or a feeling of tightness in your chest?**

Age in years (answer "1" if younger than age 1 year) \_\_\_\_\_

Don't know \_\_\_\_\_



Questions 14-15 are about symptoms that occur when respondents DO NOT have a cold or the flu.)

**14.a. In the past 12 months, have you been bothered by sneezing or a runny or blocked nose when you DID NOT have a cold or the flu?**

- Yes →  
 No



14.b. In which of the past 12 months were you bothered by sneezing or a runny or blocked nose when you DID NOT have a cold or the flu?

- 14.b.1. January       Yes  No  
14.b.2. February     Yes  No  
14.b.3. March         Yes  No  
14.b.4. April         Yes  No  
14.b.5. May           Yes  No  
14.b.6. June          Yes  No  
14.b.7. July          Yes  No  
14.b.8. August       Yes  No  
14.b.9. September    Yes  No  
14.b.10. October     Yes  No  
14.b.11. November    Yes  No  
14.b.12. December    Yes  No

*14.c. When you are away from your current job (such as on weekends or vacations) are your nose symptoms better, worse, or unchanged? (If more than one current job, consider the job you spend the most time doing.)*

**15.a. In the past 12 months, have you been bothered by watery, itchy, or burning eyes when you DID NOT have a cold or the flu?**

- Yes →  
 No



**15.b. In which of the past 12 months were you bothered watery, itchy, or burning eyes when you DID NOT have a cold or the flu?**

- 15.b.1. January       Yes  No  
15.b.2. February     Yes  No  
15.b.3. March         Yes  No  
15.b.4. April          Yes  No  
15.b.5. May            Yes  No  
15.b.6. June           Yes  No  
15.b.7. July           Yes  No  
15.b.8. August        Yes  No  
15.b.9. September    Yes  No  
15.b.10. October      Yes  No  
15.b.11. November    Yes  No  
15.b.12. December    Yes  No

*15.c. When you are away from your current job (such as on weekends or vacations) are your eye symptoms better, worse, or unchanged? (If more than one current job, consider the job you spend the most time doing.)*

*\_\_\_ better \_\_\_ worse \_\_\_ unchanged \_\_\_ Don't know*

*\_\_\_ not applicable since do not have a current job that involves work out of the home*

**16. When you are near animals such as cats, dogs, or horses or near feathers including pillows, quilts or comforters or in a dusty or moldy part of the house, do you ever:**

	Yes	No
start to cough?	16.a. _____	_____
start to wheeze?	16.b. _____	_____
start to feel short of breath?	16.c. _____	_____
get a feeling of tightness in your chest?	16.d. _____	_____
get a runny or stuffy nose or start to sneeze?	16.e. _____	_____
get itching or watering eyes?	16.f. _____	_____

**17. When you are near trees, grass, or flowers, or when there is a lot of pollen in the air, do you ever**

	Yes	No
start to cough?	17.a. _____	_____
start to wheeze?	17.b. _____	_____
start to feel short of breath	17.c. _____	_____
get a feeling of tightness in your chest?	17.d. _____	_____
get a runny or stuffy nose or start to sneeze?	17.e. _____	_____
get itching or watering eyes?	17.f. _____	_____

**18. When you are near strong odors such as perfume or bleach or near smoke, do you ever start to cough, wheeze, feel short of breath, or feel tightness in your chest?**

Yes  No

**19. When you exercise or exert yourself or when the air is cold, do you ever start to cough, wheeze, feel short of breath, or feel tightness in your chest?**

Yes  No

**20. Are you unable to walk due to a condition other than shortness of breath?**

Yes No

If yes, please describe and skip to question 22.

Nature of condition(s): \_\_\_\_\_

**21.a. Are you troubled by shortness of breath when hurrying on level ground or walking up a slight hill?**

Yes    No [Skip to question 22]

**21.b. Do you have to walk slower than people of your age on level ground because of shortness of breath?**

Yes    No    Does not apply

**21.c. Do you ever have to stop for breath when walking at your own pace on level ground?**

Yes    No    Does not apply

**21.d. Do you ever have to stop for breath after walking about 100 yards (or after a few minutes) on level ground?**

Yes    No    Does not apply

**21.e. Are you too short of breath to leave the house or short of breath on dressing or undressing?**

Yes    No    Does not apply

Questions 22 and 23 are about snoring and breathing during sleep. To answer these questions, please consider both what others have told you AND what you know about yourself.

**22.a. In the past 12 months, have you snored while you were sleeping?**

Yes

No [Skip to question 23]

Don't know [Skip to question 23]

**22.b. In the past 12 months, about how many nights per week do you snore?**

Do not snore any more

Rarely – less than one night a week

Sometimes – 1 or 2 nights a week

Frequently – 3 to 5 nights a week

Always or almost always – 6 or 7 nights a week

Don't know

**23.a. In the past 12 months, have you snorted, gasped, or stopped breathing while you were asleep?**

Yes

No [Skip to question 24]

Don't know [Skip to question 24]

**23.b. In the past 12 months, about how many nights per week do you snort, gasp, or stop breathing while you are asleep?**

Do not snort, gasp, or stop breathing any more

Rarely – less than one night a week

Sometimes – 1 or 2 nights a week

Frequently – 3 to 5 nights a week

Always or almost always – 6 or 7 nights a week

Don't know

**24.a. In the past 12 months, have you had excessive (too much) daytime sleepiness?**

Yes

No [Skip to question 25]

Don't know [Skip to question 25]

**24.b. In the past 12 months, about how many days per week have you had excessive (too much) daytime sleepiness?**

Not sleepy any more

Rarely – less than one day a week

Sometimes – 1 or 2 days a week

Frequently – 3 to 5 days a week

Always or almost always – 6 or 7 day a week

Don't know

**25. In the past 12 months, about how many days of work or school did you miss because of respiratory illnesses or symptoms?**

None \_\_\_\_\_

1-5 \_\_\_\_\_

6-15 \_\_\_\_\_

16 or more \_\_\_\_\_

or Not applicable (do not work or go to school) [Skip to question 27]

**26.a. In the past 12 months, have you had respiratory symptoms such as cough, wheeze, shortness of breath, or chest tightness that changed on weekends, vacations, or other times when you were away from your current job? If more than one current job, consider the job you spend the most time doing.**

- Yes
- No [Skip to question 27]
- Don't know [Skip to question 27]
- Not applicable since do not have a current job that involves work out of the home [Skip to question 27]

**26.b. In the past 12 months, did your respiratory symptoms get better or worse when you were away from your current job?**

- Better away from work
- Worse away from work
- Don't know

**26.c. Is your chest tight or your breathing difficult on any particular day of the week?**

- Yes
- No [Skip to question 27]
- Don't know [Skip to question 27]

**26.d. On which day(s) is your chest tight or your breathing difficult?**

**26.d.1. 1st day back to work after several days away from your current workplace?**

- Yes
- Sometimes
- No

**26.d.2. 2nd day back to work after several days away from your current workplace?**

- Yes
- Sometimes
- No

**26.d.1. 3<sup>rd</sup>, 4<sup>th</sup>, or other day back to work after several days away from your current workplace?**

- Yes
- Sometimes
- No

**26.e. At what time of the work day does your chest feel tight or your breathing difficult?**

*(check all that apply)*

- Before entering my current workplace
- While at my current workplace
- After leaving my current workplace
- Don't know

**Part 3. Respiratory Conditions**

**27.a. Have you ever had asthma?**

Yes

No [Skip to question 28]

Don't know [Skip to question 28]

**27.b. At about what age did it start?**

\_\_\_\_ Age in years [Enter number]

or

\_\_\_\_ As a child; age not known [Check if appropriate]

**27.c. Was it diagnosed by a doctor or other health professional?**

Yes          No          Don't know

**27.d. Do you still have it?**

Yes [Skip to question 27.f.]          No          Don't know

**27.e. If you no longer have it, at what age did it stop?**

\_\_\_\_\_ Age in years

\_\_\_\_\_ Does not apply – still have it

**27.f. In the past 12 months, have you received medical treatment, taken medications or used an inhaler for asthma?**

Yes          No

**27.g. When you first developed symptoms of asthma, were you employed?**

Yes          No [Skip to question 27.k.]          Don't know [Skip to question 27.k.]

**27.h. What was the job you had when you first developed symptoms of asthma?**  
(If you had more than one job, report the job you spent the most time doing.)

\_\_\_\_\_

**27.i. What did you do in that job?**

\_\_\_\_\_

**27.j. What kind of business or industry was that job in?**

\_\_\_\_\_

**27.k. Did you experience an episode of exposure to high levels of vapors, gases, dust, or fumes shortly before you first developed symptoms of asthma?**

Yes

No [Skip to question 28]

Don't know [Skip to question 28]

**27.l. Where did this high exposure episode occur?**

At home

At the job you just described (if employed when asthma symptoms first developed)

Elsewhere

Don't know

**28.a. Have you ever had hay fever? An allergy involving the nose and/or eyes.**

Yes

No [Skip to question 29]

Don't know [Skip to question 29]

**28.b. At about what age did it start?**

\_\_\_\_ Age in years [Enter number]

or

\_\_\_\_ As a child; age not known [Check if appropriate]

**28.c. Was it diagnosed by a doctor or other health professional?**

Yes

No

Don't know

**28.d. Do you still have it?**

Yes [Skip to question 28. F.]

No

Don't know

**28e. If you no longer have it, at what age did it stop?**

\_\_\_\_ Age in years

\_\_\_\_ Does not apply – still have it

**28.f. In the past 12 months, have you received medical treatment, taken medications or used a nasal spray for hay fever?**

Yes

No

**9.a. Have you ever had bronchitis?**

Yes

No [Skip to question 30]

Don't know [Skip to question 30]

**29.b. Was it diagnosed by a doctor or other health professional?**

Yes

No

Don't know

**29.c. At about what age did you first have bronchitis?**

\_\_\_\_ Age in years [Enter number]

or

\_\_\_\_ As a child; age not known [Check if appropriate]

**29.d. How many times have you had bronchitis?**

\_\_\_\_ Times [Enter number]



**30.a. Have you ever had pneumonia or bronchopneumonia?**

Yes

No [Skip to question 31]

Don't know [Skip to question 31]

**30.b. Was it diagnosed by a doctor or other health professional?**

Yes

No

Don't know

**30.c. At about what age did you first have pneumonia or bronchopneumonia?**

\_\_\_ Age in years [Enter number]

or

\_\_\_ As a child; age not known [Check if appropriate]

Probe: How do you remember?

**30.d. How many times have you had pneumonia or bronchopneumonia?**

\_\_\_ Times [Enter number]

**31.a. Have you ever had chronic bronchitis?**

Yes

No [Skip to question 32]

Don't know [Skip to question 32]

**31.b. Was it diagnosed by a doctor or other health professional?**

Yes

No

**31.c. At about what age did it start?**

\_\_\_ Age in years

**31.d. Do you still have it?**

Yes

No

Don't know

**31.e. In the past 12 months, have you received medical treatment, taken medications or used an inhaler for chronic bronchitis?**

Yes

No

**32.a. Have you ever had emphysema?**

Yes

No [Skip to question 33]

Don't know [Skip to question 33]

**32.b. Was it diagnosed by a doctor or other health professional?**

Yes

No

**32.c. At about what age did it start?**

\_\_\_ Age in years

**32.d. Do you still have it?**

Yes

No

Don't know

**32.e. In the past 12 months, have you received medical treatment, taken medications or used an inhaler for emphysema?**

Yes

No

**33.a. Have you ever had COPD (chronic obstructive pulmonary disease)?**

Yes

No [Skip to question 34]

Don't know [Skip to question 34]

**33.b. Was it diagnosed by a doctor or other health professional?**

Yes

No

**33.c. At about what age did it start?**

\_\_\_ Age in years

**33.d. Do you still have it?**

Yes

No

Don't know

**33.e. In the past 12 months, have you received medical treatment, taken medications or used an inhaler for COPD?**

Yes

No

**34.a. Have you ever had sleep apnea?**

Yes

No [Skip to question 35]

Don't know [Skip to question 35]

**34.b. Was it diagnosed by a doctor or other health professional?**

Yes

No

**34.c. At about what age did it start?**

\_\_\_\_ Age in years

**34.d. Do you still have it?**

Yes

No

Don't know

**34.e. In the past 12 months, have you received any treatment for sleep apnea?**

Yes

No

**35.a. Have you ever had pulmonary fibrosis, IPF, or pneumoconiosis?**

Yes

No [Skip to question 36]

Don't know [Skip to question 36]

**35.b. Was it diagnosed by a doctor or other health professional?**

Yes

No

**35.c. At about what age did it start?**

\_\_\_\_ Age in years

Probe: How do you remember?

**35.d. Do you still have it?**

Yes

No

Don't know

**35.e. In the past 12 months, have you received any treatment for pulmonary fibrosis, IPF, or pneumoconiosis?**

Yes

No

**35.f. Was your pulmonary fibrosis, IPF, or pneumoconiosis confirmed by a chest x-ray or CT scan?**

Yes

No

**35.g. Was the cause known?**

Yes

No [Skip to question 36]

**35.h. Please specify the cause:**

---

**36. Have you ever had:**

**36.a. Any other chest illnesses?**      Yes      No      If yes, please specify:

**36.b. Any chest operations?**      Yes      No      If yes, please specify:

**36.c. Any chest injuries?**      Yes      No      If yes, please specify

**37.a. Has a doctor or other health professional ever told you that you had coronary artery disease, angina, heart attack, or myocardial infarction? Please answer 'yes' if you have had coronary artery bypass graft surgery, coronary angioplasty, or a coronary stent procedure.**

Yes

No [Skip to question 38]

Don't know [Skip to question 38]

**37.b. In the past 12 months, have you received any medical treatment for this condition?**

Yes No

**38.a. Has a doctor or other health professional ever told you that you had heart failure or congestive heart failure?**

Yes

No [Skip to question 39]

Don't know [Skip to question 39]

**38.b. In the past 12 months, have you received any medical treatment for this condition?**

Yes No

**39.a. Has a doctor or other health professional ever told you that you had high blood pressure?**

Yes

No [Skip to question 40]

Don't know [Skip to question 40]

**39.b. In the past 12 months, have you received any medical treatment for high blood pressure?**

Yes No

**40.a. Has a doctor or other health professional ever told you that you had diabetes?**

Yes

No [Skip to question 41]

Don't know [Skip to question 41]

**40.b. In the past 12 months, have you received any medical treatment for diabetes?**

Yes No

**41.a. Has a doctor or other health professional ever told you that you had a high cholesterol or high triglyceride level?**

Yes

No [Skip to question 42]

Don't know [Skip to question 42]

**41.b. In the past 12 months, have you received any medical treatment for this condition?**

Yes No

**42.a. Has a doctor or other health professional ever told you that you had a stroke or peripheral vascular disease (arterial circulation problems)?**

Yes

No [Skip to question 43]

Don't know [Skip to question 43]

**42.b. In the past 12 months, have you received any medical treatment for this condition?**

Yes No

**43. What is your height?**

\_\_\_ ft \_\_\_ in

**44. What is your weight?**

\_\_\_\_\_ lbs.

**Part 4. Environmental Exposures**

**Cigarette smoking**

**45.a. Have you ever smoked cigarettes? No means less than 20 packs of cigarettes or 12 oz. of tobacco in your lifetime or less than 1 cigarette a day for one year at any time in your life.**

Yes

No [Skip to question 46]

**45.b. How old were you when you first started regular cigarette smoking?**

\_\_\_\_\_ years old

**45.c. Do you now smoke cigarettes as of one month ago?**

Yes [Go to 45.d.]

No [Go to 45.g.]

**45.d. How many cigarettes do you smoke per day now?**

\_\_\_\_\_ cigarettes per day  
(1=1 or fewer per day)

**45.e. Did you ever quit smoking for 6 months or longer?**

Yes

No [Skip to 45.j.]

**45.f. For how many years in total did you quit smoking?**

\_\_\_\_\_ years

GO TO 45.j.

**45.g. How old were you when you completely stopped smoking?**

\_\_\_\_\_ years old

**45.h. When you were a smoker, did you ever quit smoking for 6 months or longer before you completely stopped smoking?**

Yes

No [Skip to 45.j.]

**45.i. During the time that you were a smoker, for how many years in total did you quit smoking?**

\_\_\_\_\_ years

GO TO 45.j.

**45.j. On the average of the entire time you smoked, how many cigarettes did you smoke per day?**

\_\_\_\_\_ cigarettes per day

**Pipe smoking**

**46.a. Have you ever smoked a pipe regularly? (Yes means more than 12 oz. of tobacco in a lifetime.)**

Yes    No [Skip to question 47]

**46.b. How old were you when you first started to smoke a pipe regularly?**

\_\_\_\_\_years old

**46.c. Do you now smoke a pipe (as of one month ago?)**

Yes [Go to 46.d.]

No [Go to 46.g.]

**46.d. How much pipe tobacco do you smoke per week now?**

\_\_\_\_\_ounces per week

**46.e. Did you ever quit smoking a pipe for 6 months or longer?**

Yes  
No [Skip to 46.j.]

**46.f. For how many years in total did you quit smoking?**

\_\_\_\_\_years

GO TO 46.j.

**46.g. How old were you when you completely stopped smoking a pipe?**

\_\_\_\_\_years old

**46.h. When you were a pipe smoker, did you ever quit smoking for 6 months or longer before you completely stopped smoking?**

Yes  
No [Skip to 46.j.]

**46.i. During the time that you were a pipe smoker, for how many years in total did you quit smoking a pipe?**

\_\_\_\_\_years

GO TO 46.j.

**46.j. On the average of the entire time you smoked a pipe, how many ounces of tobacco did you smoke per week?**

\_\_\_\_\_ounces per week



**Cigar smoking**

**47.a. Have you ever smoked cigars regularly? (Yes means more than 1 cigar a week for one year at any time in your life.)**

Yes No [Skip to question 48]

**47.b. How old were you when you first started to smoke cigars regularly?**

\_\_\_\_\_years old

**47.c. Do you now smoke cigars (as of one month ago?)**

Yes [Go to 47.d.]

No [Go to 47.g.]

**47.d. How many cigars do you smoke per week now?**  
\_\_\_\_\_cigars per week

**47.e. Did you ever quit smoking for 6 months or longer?**  
Yes  
No [Skip to 47.j.]

**47.f. For how many years in total did you quit smoking?**  
\_\_\_\_\_years

GO TO 47.j.

**47.g. How old were you when you completely stopped smoking cigars?**  
\_\_\_\_\_years old

**47.h. When you were a smoker, did you ever quit smoking for 6 months or longer before you completely stopped smoking?**  
Yes  
No [Skip to 47.j.]

**47.i. During the time that you were a smoker, for how many years in total did you quit smoking?**  
\_\_\_\_\_years

GO TO 47.j.

**47.j. On the average of the entire time you smoked, how many cigars did you smoke per week?**

\_\_\_\_\_cigars per week

**Second-hand smoke exposure**

**48.a. In your childhood, did you live with a regular cigarette smoker who smoked in your home?**

- Yes
- No [Skip to question 49]
- Don't know [Skip to question 49]

Did ...	YES	NO	DON'T
KNOW			
<b>48.b. your Mother smoke in home</b> _____	_____	_____	
<b>48.c. your Father smoke in home</b> _____	_____	_____	
<b>48.d. Other household members smoke in the home</b> _____	_____	_____	
<b>48.e. If YES to Others: How many others?</b>			
1 _____			
2-3 _____			
4+ _____			
Don't know _____			

**49.a. As an adult, have you ever lived with a regular cigarette smoker (not including yourself) who smoked in your home?**

- Yes
- No [Skip to question 50]

<b>49.b. As an adult, for how many total years did you live with a regular cigarette smoker who smoked in your home?</b> _____ years
<b>49.c. In the past 12 months have you lived with a regular cigarette smoker who smoked in your home?</b> Yes      No [Skip to question 50.A.]
<b>49.d. In the past 12 months, for how many hours per day on average are you at home while someone other than yourself is smoking there?</b> _____ hours per day

**50.a. In the past 12 months, when you are not at home, do you regularly spend time indoors where there are people who are smoking cigarettes?**

Yes    No [Skip to question 51]

**50.b. As an adult, for how many total years have you spent time, when you are not at home, indoors where there are people smoking cigarettes?**

\_\_\_\_\_ years

**50.c. In the past 12 months, how many hours per week on average do you spend in a place where people are smoking?**

\_\_\_\_\_ hours per week

**Current home environment**

**51. How many rooms (not counting bathrooms) are there in your house/apartment?**

\_\_\_\_\_ Number of rooms

**52. How many people live in your home?**

\_\_\_\_\_ Number of people

**53. What kind of stove do you mostly use for cooking?**

coal, coke or wood (solid fuel) \_\_\_\_\_

gas with electric starter \_\_\_\_\_

gas with constant pilot light \_\_\_\_\_

electric \_\_\_\_\_

microwave \_\_\_\_\_

paraffin \_\_\_\_\_

other (specify) \_\_\_\_\_

**54. During the last 12 months has there been any flooding or water damage in your home?**

Yes    No

**55. During the last 12 months have you noted any mold or mildew on any surface, other than food, inside your home?**

Yes    No

**56.a-c Do you currently have any of the following pets living in your home?**

**56.a. Cat** Yes\_\_\_ No\_\_\_

**56.b. Dog** Yes\_\_\_ No\_\_\_

**56.c. Other furry pets** Yes\_\_\_ No\_\_\_

**57.a-c. In the last 12 months have you noted any of the following pests in your home?**

**57.a. Cockroaches** Yes\_\_\_ No\_\_\_

**57.b. Mice** Yes\_\_\_ No\_\_\_

**57.c. Rats** Yes\_\_\_ No\_\_\_

**Part 5. Educational and occupational history**

**62.a. Have you ever been exposed at work to vapors, gas, dust or fumes?**

Yes No [Skip to question 63]

<p><b>If yes, when did it happen?</b></p> <p>62.b. Current job _____</p> <p>62.c. Job you have worked at longest _____</p> <p>62.d. Other job. Specify: _____</p>
---

**Part 6. Family history**

**63.a-h. Were either of your natural (biologic) parents ever told by a doctor or other health professional that they had any of the following conditions?**

	FATHER			MOTHER		
	Yes	No	Don't know	Yes	No	Don't know
<b>63.a. Chronic Bronchitis</b>	___	___	___	___	___	___
<b>63.b. Emphysema</b>	___	___	___	___	___	___
<b>63.c. Chronic Obstructive Pulmonary Disease (COPD)</b>	___	___	___	___	___	___
<b>63.d. Asthma</b>	___	___	___	___	___	___
<b>63.e. Hay fever (allergy involving the nose and/or eyes)?</b>	___	___	___	___	___	___
<b>63.f. Lung Cancer</b>	___	___	___	___	___	___
<b>63.g. Sleep Apnea</b>	___	___	___	___	___	___
<b>63.h. Other lung diseases</b>	___	___	___	___	___	___

**64. Did or does your natural (biologic) parent ever smoke cigarettes?**

64.a. FATHER			64.b. MOTHER		
Yes	No	Don't know	Yes	No	Don't know

**65. Is your natural (biologic) parent currently alive?**

65.a. FATHER  
Yes No Don't know

65.b. MOTHER  
Yes No Don't know

**66. Please specify:**

66.b. FATHER  
\_\_\_\_ Age if living  
\_\_\_\_ Age at death  
Don't know \_\_\_\_

66b. MOTHER  
\_\_\_\_ Age if living  
\_\_\_\_ Age at death  
Don't know \_\_\_\_

**67. Please specify cause of death:**

67.a. FATHER\_\_\_\_\_

67.b. Mother\_\_\_\_\_