

Appendix 6: Analysis Plan for Pre-testing the WG Short Measurement Set on Disability

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1. Objective

The objective of the proposed analysis plan is to test the consistency of the short set of questions drafted by the WG in regards to how their interpretation may differ across different core domains, countries, and subpopulations. The analysis plan refers to the field test and is meant to compliment the cognitive testing being undertaken to gain deeper insight into how these core questions are understood by respondents.

2. Test Questions

Core Questions: The WG short question set consists of four core questions aimed at four different domains – seeing, hearing, mobility, and concentration and remembering – and two additional questions aimed at slightly higher order activities, namely self-care and communication.

These questions and the response choices are as follows:

1. Do you have difficulty seeing, even if wearing glasses?
 - a. No - no difficulty
 - b. Yes – some difficulty
 - c. Yes – a lot of difficulty
 - d. Cannot do at all

2. Do you have difficulty hearing, even if using a hearing aid?
 - a. No- no difficulty
 - b. Yes – some difficulty
 - c. Yes – a lot of difficulty
 - d. Cannot do at all

3. Do you have difficulty walking or climbing steps?
 - a. No- no difficulty
 - b. Yes – some difficulty
 - c. Yes – a lot of difficulty
 - d. Cannot do at all

4. Do you have difficulty remembering or concentrating?
 - a. No – no difficulty
 - b. Yes – some difficulty
 - c. Yes – a lot of difficulty
 - d. Cannot do at all

5. Do you have difficulty (with self-care such as) washing all over or dressing?
 - a. No – no difficulty
 - b. Yes – some difficulty
 - c. Yes – a lot of difficulty
 - d. Cannot do at all

6. Because of a physical, mental or emotional health condition, do you have difficulty communicating, (for example understanding others or others understanding you)?
 - a. No – no difficulty
 - b. Yes – some difficulty
 - c. Yes – a lot of difficulty
 - d. Cannot do at all

For ease of exposition, these questions will be referred to as questions on vision, hearing, mobility, remembering, self-care, and communication. Including all six questions in the pre-test is preferred, but if resources are too limited then the questions which should be excluded are those referring to self-care and communication.

Extended questions: The core questions are geared at a very general level. With a more extended measure, questions could uncover a more detailed depiction of a person's level of functioning. For example, what is meant by "some difficulty" seeing? What if a person has no difficulty seeing things close at hand but a lot of difficulty seeing things at a distance? Will a respondent average the two responses and report "some difficulty"?

In order to obtain a better sense of what responses to these core questions indicate, the pilot test will include some extended questions in the core areas in order to benchmark the responses to the more general questions. These extended questions are drawn from the Washington Group's working document on extended measures. They are:

Vision

- i. Do you have difficulty seeing and recognizing a person you know from 7 meters (20 feet) away?
- ii. Do you have difficulty seeing and recognizing an object at arm's length

Hearing

- i. Do you have difficulty hearing someone talking on the other side of the room in a normal voice?
- ii. Do you have difficulty hearing what is said in a conversation with one other person in a quiet room?

Mobility

- i. Do you have difficulty moving around inside your home?
- ii. Do you have difficulty going outside of your home?
- iii. Do you have difficulty walking a long distance such as a kilometer (or equivalent)?

Remembering

- i. Do you have difficulty concentrating on doing something for ten minutes?
- ii. Do you have difficulty remembering to do important things?

Self-care

- i. Do you have difficulty washing your whole body?
- ii. Do you have difficulty getting dressed?
- iii. Do you have difficulty feeding yourself?
- iv. Do you have difficulty staying by yourself for a few days?

Communicating

- i. Do you have difficulty generally understanding what people say?
- ii. Do you have difficulty starting and maintaining a conversation?
- iii. Do others generally have difficulty understanding you?

The responses for all of these questions are: No Difficulty, Some Difficulty, A lot of Difficulty; Can't do at all

Additional extended questions are available in two other domains if there is space on the field test. These include:

Learning

- i Do you have difficulty learning a new task, for example learning how to get to a new place? (Countries to think of appropriate examples of a new task)
- ii Do you have difficulty analyzing and finding solutions to problems in day to day life?

Interpersonal interactions

- i Do you have difficulty dealing with people you do not know?
- ii Do you have difficulty maintaining a friendship?
- iii Do you have difficulty getting along with people who are close to you?
- iv Do you have difficulty making new friends?

The same responses should be used for these additional domains;

- No difficulty Some difficulty A lot of difficulty Can't do at all

Finally, it would be useful to be able to include questions that tap into the psychological domain if that is culturally acceptable. The following set of questions can be used for that purpose. Instructions for analysis of these questions will be forthcoming in the finalized draft of the protocol.

How much, during the past 4 weeks....

		All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
mhi1	Did you feel very nervous?	1	2	3	4	5	6

mhi2	Have you felt so down in the dumps, nothing could cheer you up?	1	2	3	4	5	6
mhi3	Have you felt calm and peaceful?	1	2	3	4	5	6
mhi4	Have you felt down-hearted and depressed?	1	2	3	4	5	6
mhi5	Have you been happy?	1	2	3	4	5	6

Previously used questions from individual countries: It would be very useful to examine the relationship between the WG questions (core and extended) and questions on disability used by countries in previous censuses. Understanding this relationship can help analysts scale up pilot test results to gain insight into national prevalence rates. Including previously used census question in the pilot test is one possible way of doing this, as will be discussed in a later section.

3. Sample

A discussion of sampling issues is found in the main implementation document entitled “Implementation Protocol for Testing the Washington Group Short Measurement Set on Disability”. However one key issue dealing with drawing the sample involves age. Evidence suggests that age is positively associated with disability. Since the purpose of this pre-test is a deeper understanding of positive responses, older people should be over-sampled. By increasing the number of disabled people in the sample, power will be added to the statistical techniques employed to assess the questions. Since age distributions differ across countries – often significantly – it is not important that the same age stratifications be used for sampling purposes. For analysis purposes, though, it will be useful to have similar age breakdowns.

4. Analysis Plan

Positive responses and prevalence

For ease of making statistical comparisons, it will be useful to transform the responses to the core questions from categorical variables to binary variables. In order not to lose the richness of the responses, the analysis will be done using different definitions of a positive response, D1, D2, D3, such that:

D1 = 1 if response is *some difficulty*, *a lot of difficulty*, or *can't do at all*, else =0

D2 = 1 if response is *a lot of difficulty* or *can't do at all*, else =0

D3 = 1 if response is *can't do at all*, else=0

Clearly, D1 is the broadest definition of a disability and D3 is the most limited.

Using these measures the core questions yields a matrix of functioning for the six domains as follows:

Table 1
Functioning Matrix

Core Domain	D1	D2	D3
Vision			
Hearing			
Mobility			
Remembering			
Self-Care			
Communicating			

Overall disability prevalence can be measured many ways, but four are proposed:

P1 = 1 if at least one domain has D1=1, else =0

P2 = 1 if at least one domain has D2=1, else =0

P3 = 1 if at least one domain has D3=1, else =0

PM = 1 if more than one domain has D1=1; else =0 (M stands for multiple domains)

Similar to the core questions, the presence of disability needs to be coded for the extended questions. Within each domain, define the following variables (with ED for extended disability measure):

ED1 = 1 if at least one extended question in a given domain has a response of *some difficulty, a lot of difficulty, or can't do at all*, else =0

ED2 = 1 if at least one extended question in a given domain has a response of *a lot of difficulty, or can't do at all*, else =0

ED3 = 1 if at least one extended question in a given domain has a response of *can't do at all*; else =0

Prevalence estimates using these extended measures (PE1, PE2, PE3, and PEM) are analogous to P1, P2, P3 and PM.

Correlation Analysis

The question remains as to the relationship between D1, D2, and D3 for the core questions and ED1, ED2, and ED3 for the extended questions. Both sets of questions should be asked for each respondent, after which we can construct the following correlation matrix for each domain, where each cell is the correlation coefficient of the variables in the corresponding row and column. For the purposes of this table, D0 and ED0 have been added, where

D0 = 1 if there are no reported difficulties; else=0

ED0 = 1 if there are no reported difficulties in any of the ED questions; else=0

	ED0	ED1	ED2	ED3
D0				
D1				
D2				
D3				

In order to not “contaminate” the results of the WG census questions, it is important that all six questions be asked prior to the extended questions. This is because respondents’ interpretation of the questions may change once they are prompted with the more detailed questions, which will not be included in a census.

Using the correlation coefficients in the above matrix it is straightforward to test if there are statistically significant differences between the D and ED measures. If those differences are statistically significant then the measures are not equivalent. The following comparisons between measures will be made for each of the six core domains:

- D0 vs. ED0
- D1 vs. ED1
- D2 vs. ED2
- D3 vs. ED3

If D is not equivalent to ED, the measures will need to be investigated further. One possibility is that ED identifies more people as having a disability because more detailed questions pick up people who more confined functional limitations. For example, they may have difficulties seeing at a distance but not up close. When only asked about seeing, in general, they may report having little difficulty since for most activities their vision is fine. Therefore, tests on whether $D < ED$ or $D > ED$ will also be reported.

Another important issue is whether certain categories of people (the elderly, the educated, etc) are reacting differently to the questions. For example, consider the following scenario: Older people are less inclined to report problems with hearing based on D because their standards of what difficulty hearing means at their age are higher. However, when asked the ED questions, they have a big jump in reported disability rates because they are responding to questions geared at more specific functional abilities. That same jump might not occur for younger people, especially if, for example, younger people tend to either have profound hearing loss or no loss whatsoever, contrary to older people, many of whom might be losing their hearing slowly.

It will be important to uncover this type of phenomenon or we might find spurious correlations between the individual characteristics and disability rates measured by the core questions that, in reality, are only a difference in how those questions are being interpreted.

Therefore, for each core domain we should examine the equivalence of D and ED for breakdowns of age, gender, education, and rural/urban. Unfortunately, this may pose difficulties if funds are not available for an adequate sample size.

5. Conclusion

Disability is a difficult concept to measure. Before the core questions developed by the WG are disseminated, it is important to have a good understanding of their effectiveness and how they are being interpreted by respondents. The analysis outlined above will help in the further refinement and use of these measures. You will be asked to share the results of your pre-testing with researchers from the Washington Group. Instructions for what data elements are requested and for where to send this data will be forthcoming once your pre-test is underway. We would also appreciate if you would keep our staff up to date on the progress of your testing plans as they progress.