

## **CHIWOS Survey Questionnaire Development Description**

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### **❖ OVERVIEW**

The CHIWOS Survey development began in October 2011 and took the most part of 2012 to develop. It is planned to be an ongoing process of refinement.

The CHIWOS Survey has been developed with the following steps to ensure psychometric validity and reliability of each section where possible and to the best of our ability:

1. **Assigning experts in the field as team leads and team members for each survey section.** CHIWOS values both professional and lived experience. As much as possible, women living with HIV have been actively involved in questionnaire development teams.
2. **Determining a priori constructs/domains of interest.** CHIWOS constructs were prepared initially for the CIHR grant submission, and developed further by questionnaire team leads and team members. A Manuscript Preparation Plan was developed to assist with construct development, and team assignment.
3. **Conducting literature searches to identify validated scales and prior studies in the area.** Kelly et al. (2003) comment, "researchers should conduct a literature search to identify existing, psychometrically tested questionnaires of relevance to the field of study." In CHIWOS, this was recommended to all questionnaire team leads and members as the first step to the questionnaire section development process.
4. **Using validated scales whenever possible.** Thorough literature searches were conducted to identify validated scales for all constructs. Whenever possible, validated scales were used. In situations where validated scales were not appropriate for use with our study population, slight modifications were made to existing validated scales. A detailed account of these changes has been recorded to ensure transparent reporting in publications. In rare circumstances, new questions were developed by study teams and have been flagged for piloting.
5. **Pilot testing of newly developed questions and modified questions from validated scales.** Questionnaire development teams were tasked with referencing the sources of all scales, and tracking all of the modifications made to existing validated scales.
6. **Consultation with Dr. Trevor Hart, Behavioural Research Methodologist,** in the preparation of this document, and the overall determination and evaluation of the psychometric properties of the CHIWOS Questionnaire sections, constructs and items.

## ❖ ITEM GENERATION & REDUCTION

**The first step in questionnaire development was to identify the domains necessary to answer the priority research questions:**

*"The purpose of item generation is to consider all potential items (ideas, concepts) for inclusion in the questionnaire, with the goal of tapping into important domains (categories or themes) suggested by the research question. Items may be generated through literature reviews, in-depth interviews, focus-group sessions, or a combination of these methods with potential respondents or experts" (Burns et al, 2008).* In CHIWOS, item generation has been accomplished through literature reviews and brainstorming meetings with experts in the field for each questionnaire section, pre-testing with numerous team members and focus groups with women living with HIV. After item generation, variables were defined and grouped into domains. Appropriate questions were then generated for each variable (Burns et al, 2008).

**In order to reduce participant burden, the number of questions within each domain must be limited in order to make the questionnaire a manageable length for participants** (Burns et al, 2008). *In CHIWOS, item reduction was extremely important due to the large number of domains required to answer our research questions. Item reduction was carried out by each questionnaire development team by limiting the number of questions per domain wherever possible. Further item reduction was carried out by members of the National Management Team (NMT). Also, women living with HIV were hired as Peer Research Associates to conduct pre-testing in order to reduce the questionnaire to an appropriate length and maintain the most relevant questions. Finally, the principal investigators of the project carried out further item reduction.*

## ❖ TESTING

**The next step of questionnaire development is testing. There are three types of testing:**

1. **"Pre-testing** focuses on the clarity and interpretation of individual questions and ensures that questions meet their intended purpose" (Burns et al, 2008). *Questionnaire section leads and teams actively assessed the relevance of all survey questions as they were developed. The CHIWOS questionnaire was reviewed by the NMT, Population Specific Teams (e.g. Trans women, African, Caribbean and Black (ACB) women, and Aboriginal women's teams), a group of Peer Research Associates, our three provincial Community Advisory Boards (CABs), the CHIWOS Steering Committee members, the CHIWOS collaborating Behavioral Research Methodologist (Dr. Trevor Hart), and the CHIWOS community-based research consultant to pre-test for clarity and relevance of questions.*
2. **"Pilot testing** focuses on the relevance, flow and arrangement of the questionnaire, in addition to the wording of the questionnaire. Although pilot testing can detect overt problems with the questionnaire, it rarely identifies their origins, which are generally unveiled during pre-testing" (Burns et al, 2008). *The paper-version of the CHIWOS*

*questionnaire was pilot tested using one-on-one interviews with 11 women living with HIV from diverse groups. In British Columbia, this was followed by a critical 2-hour debriefing discussion among the research team members. In Ontario and Quebec, the thorough debriefing was done after each interview. The online-version of the CHIWOS questionnaire was pilot tested with 18 diverse women living with HIV in British Columbia, Ontario and Quebec; again followed by a team debriefing session, or focus group, in each province. The CHIWOS survey consultant supported the incorporation of survey logic and skip patterns during and after the pilot testing. When approximately 100 participants are recruited in each province, they will act as an additional pilot group, and Cronbach's alphas will be calculated for the various constructs.*

3. **“Clinical sensibility** testing focuses on how well the questionnaire addresses the topic of interest and the survey objective” (Burns et al, 2008). *CHIWOS questionnaire leads and teams focused on selecting the best possible scales and questions to adequately address each construct. The CHIWOS NMT conducted a final review of the entire questionnaire to ensure that all constructs were addressed. Finally, the questionnaire was presented to three provincial CABs for expert opinions.*

Kelly et al. (2003) note that, "a (questionnaire) research tool must also demonstrate the psychometric properties of reliability (consistency from one measurement to the next), validity (accurate measurement of the concept), and, if a longitudinal study, responsiveness to change. **We will be taking the following steps in order to establish both reliability and validity of our tool.**

#### ❖ VALIDITY

**There are four types of validity, which will be assessed for specific items and scales within the CHIWOS Questionnaire:**

1. **Face validity:** “This is the most subjective aspect of validity testing. Experts and sample participants evaluate whether the questionnaire measures what it intends to measure during clinical sensibility testing” (Burns et al, 2008). *In CHIWOS, face validity was sought by engaging experts to form the questionnaire development working groups for each section. Face validity was also verified in the pre-testing steps outlined above. Finally, face validity was assessed in the pilot focus groups. The pilot focus groups also allowed for the assessment of comprehensibility and flow of the questionnaire.*
2. **Content validity:** “This assessment is best performed by experts (in content or instrument development) who evaluate whether questionnaire content accurately assesses all fundamental aspects of the topic” (Burns et al, 2008). *In CHIWOS, content validity was also achieved as best as possible by engaging experts to form the questionnaire development working groups for each section.*
3. **Construct validity:** “This is the most abstract validity assessment. It should be evaluated if specific criteria cannot be identified that adequately define the construct being measured. Expert determination of content validity or *factor analysis* can substantiate that key constructs underpinning the content are included” (Burns et al, 2008). *In CHIWOS, construct validity will be assessed for many of the questionnaire sections, particularly those that*

*consist of modified scales or new questions. It will be assessed by statistical tests of convergent, divergent, and discriminant validity of sets of items in a construct, and by tests of internal consistency of sets of items in a construct. Construct validity will be conducted in part using factor analysis. Face validity, a type of content validity, was also verified in the pre-testing steps outlined above.*

4. **Criterion Validity:** An additional type of validity that can be assessed in Questionnaire development wherein, "...responses to survey items are compared to a 'gold standard'" (Burns et al, 2008). *In CHIWOS, criterion validity will not be assessed, as most constructs being assessed do not have a gold standard or the gold standard is being used.*

**Responsiveness to change is an additional measure that looks at how respondents' answers change over time in a longitudinal study.** In CHIWOS, responsiveness to change will not be measured, however we hope that this will be determined in future intervention studies.

#### ❖ RELIABILITY

**Two types of Reliability testing are typically used in questionnaire development:**

1. **Test-retest reliability:** "With this method, investigators assess whether the same question posed to the same individuals yields consistent results at different times (typically spanning 2–4 weeks)" (Burns et al, 2008).
2. **Internal Consistency:** "Investigators appraise whether different items tapping into the same construct are correlated. Three tests can be used to assess internal consistency: the corrected item-total correlation (assesses the correlation of an item with the sum of all other items), split-half reliability (assesses correlation between scores derived by splitting a set of questions in half) and the reliability coefficients (derived by determining key dimensions and assessing items that tap into specific dimensions)" (Burns et al, 2008). *In CHIWOS, this will be established by statistical analysis for each construct whenever possible and will include Cronbach's alpha determination, exploratory factor analysis, confirmatory factor analysis and item-total correlation.*

Table 3: Statistical tests used in reliability assessments*					
Type of reliability testing	Description	Type of data; correlation coefficients			
		Nominal	Ordinal	Interval	Other
Test-retest	To assess whether the same question posed to the same individuals yields consistent results at different times	Chi-square based	Spearman rho	Pearson <i>r</i>	
Interrater	To assess whether different respondents provide similar results	Kappa	Spearman rho	Pearson <i>r</i>	Intra-class (several raters, continuous data)
Internal consistency	To assess whether different items tapping into the same construct are correlated		Spearman-Brown Cronbach alpha	Corrected item-total <i>r</i>	Kuder-Richardson (dichotomous data)

\*Adapted, with permission, from Carmines and Zeller.<sup>27</sup>

(Burns et al. 2008)

#### ❖ REPORTING

**The above is critically important to ensure adequate reporting for the purpose of manuscript development and publication.**

- Kelly et al. (2003) explain that in manuscripts you must, "...describe the research tool. If an existing tool is used, briefly state its psychometric properties and provide references to the original development work. If a new tool is used, you should include an entire section describing the steps undertaken to develop and test the tool, including results of psychometric testing." Comprehensive and transparent reporting allows readers to appropriately assess the validity of the Questionnaire and study results (Burns et al., 2009). *Following the above steps will allow us to produce high quality data that meet the reporting criteria of high-impact journals.*

**Table 4:** Questions to consider when preparing a report of findings from postal surveys\*

Section	Question
Abstract	<ul style="list-style-type: none"> <li>• Is the objective clearly stated?</li> <li>• Is the design of the study stated?</li> <li>• Is the study setting well described?</li> <li>• Is the survey population described?</li> <li>• Is the response rate reported?</li> <li>• Are the outcome measures identified?</li> <li>• Are the main results clearly reported?</li> <li>• Are the conclusions appropriate?</li> </ul>
Introduction	<ul style="list-style-type: none"> <li>• Is the problem clearly stated?</li> <li>• Is the pertinent literature cited and critically appraised?</li> <li>• Is the relevance of the research question explained?</li> <li>• Is the objective clearly stated?</li> </ul>
Methods	<ul style="list-style-type: none"> <li>• Is the study design appropriate to the objective?</li> <li>• Is the setting clearly described?</li> <li>• Are the methods described clearly enough to permit other researchers to duplicate the study?</li> <li>• Is the survey sample likely to be representative of the population?</li> <li>• Is the questionnaire described adequately?</li> <li>• Have the validity and reliability of the questionnaire been established?</li> <li>• Was the questionnaire administered in a satisfactory way?</li> <li>• Are the statistical methods used appropriately?</li> </ul>
Results	<ul style="list-style-type: none"> <li>• Do the results address the objective?</li> <li>• Are all respondents accounted for?</li> <li>• Are the results clearly and logically presented?</li> <li>• Are the tables and figures appropriate?</li> <li>• Are the numbers consistent in the text and the tables?</li> </ul>
Discussion	<ul style="list-style-type: none"> <li>• Are the results succinctly summarized?</li> <li>• Are the implications of the results stated?</li> <li>• Are other interpretations considered and refuted?</li> <li>• Are the limitations of the study and its results explained?</li> <li>• Are appropriate conclusions drawn?</li> </ul>

\*Modified from Huston.<sup>20</sup>

**Table I.** Guidelines for Best Practices in the Reporting of Participatory Action Research (PAR)

<p>Plan Ahead for Organizational Structure</p> <ul style="list-style-type: none"> <li>Adapt conventional organizational headings, or</li> <li>Consider deriving organizational structure from project design elements or emergent themes, or</li> <li>Consider a chronological or narrative framework</li> </ul> <p>Convey the Key Elements of the Project</p> <ul style="list-style-type: none"> <li>How was the project initiated?</li> <li>What was the project's timeframe?</li> <li>Who were the participants and/or co-researchers?</li> <li>What was the extent of their participation and the nature of their roles?</li> <li>What was the process within and/or the methodology of the project?</li> <li>What were the project outcomes and/or emergent actions?</li> <li>What comes next (if the project is ongoing)?</li> <li>Consider charts, timelines, tables, or other graphics to convey part or all of the project design</li> </ul> <p>Convey the Experiences of Co-Researchers</p> <ul style="list-style-type: none"> <li>Pay attention to who is writing the article and how their voices and experiences are represented</li> <li>Pay attention to who is <i>not</i> writing the article and how their voices and experiences are represented</li> <li>What were the personal outcomes of the project?</li> </ul> <p>Address the Challenges, Pitfalls, and Limitations of the Project</p> <ul style="list-style-type: none"> <li>What were they?</li> <li>How were they managed?</li> <li>What can we learn?</li> </ul>
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(Smith et al, 2011)

(Burns et al., 2008)

## ❖ REFERENCES

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