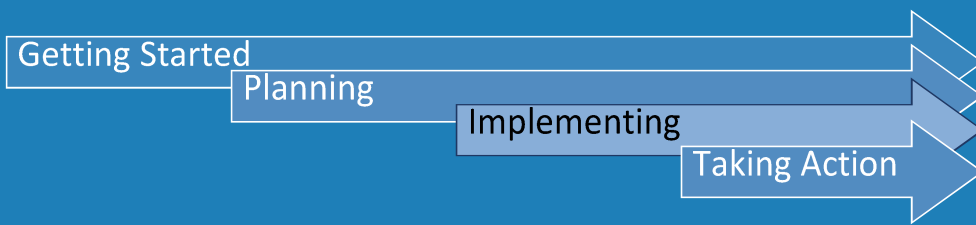


Statistical Training on WHO Vaccination Coverage



Vaccination Coverage Quality Indicators (VCQI) Inputs

VCQI User's Guide

Madrid, September 2016



Today's Plan

- VCQI Vision
- Coverage survey analysis overview (Manual Chapter 6)
- VCQI Outputs
- **VCQI Inputs & Control Program**
- Run VCQI examples; change inputs & re-run
- Future topics

Session Objectives

- Understand inputs to VCQI
- Overview of control program sections
- How they affect & control outputs

Inputs

- Datasets
 - CM contains cluster info (metadata)
 - HH contains data from household listing
 - HM contains data from household member listing
 - RI contains responses to RI questions...data from card & recall & demographics & attitudes & knowledge & why not vaccinated
 - RIHC contains RI data from health centre: EPI register evidence of vaccination
 - TT responses to TT questions...data from card & recall
 - TTHC contains TT data from health centre, if appropriate
 - SIA contains responses to SIA questions

Inputs

- Datasets have variables named & coded in accordance with VCQI Form and Variable List (FVL) document
- Datasets may contain additional variables, too (other questions...other stratifiers...wealth...etc.)
- Datasets may be named anything, but should be organized as described in FVL
- Contact me if you want to translate datasets from your survey into VCQI compatible format

Inputs

- List of strata
 - What were the primary geographic or administrative strata for the survey?
 - We call these level 3 strata
 - Can aggregate up to level 2
 - Can aggregate again up to level 1
 - If we stratify results by demographic variables, we call those level 4
 - Make small datasets listing name of level 1-4 strata
 - Make small datasets indicating which order to list results
 - See VCQI User's Guide Annex A & B

Inputs

- The remainder of inputs are typed into the control program
- You have control program examples in the sub-folders in
~/Documents/VCQI training and programs/
VCQI Output
- You have control program templates in
~/Documents/VCQI training and programs/
VCQI Programs/CONTROL

Control Program Outline

Block of Stata Code		User Edits?
A	Initialize Stata – clean out old data, programs, and macros	No
B	List input and output folders & name for this analysis	Yes
C	Open the log file & document VCQI program versions	No
D	List datasets & metadata re: schedule, survey & analysis	Yes
E	VCQI checks inputs; pre-process analysis dataset	No
F	List which indicators to calculate & specify inputs	Yes
G	VCQI closes log, deletes temp files, informs re: errors	No

Block A – Clean Start

```
*****
* Code Block: TT-A                                     (Do not change)
*-----
*               Start with clear memory
*-----

set more off

clear all

macro drop _all
```

Block B – Folders & Analysis Name

```
*****
* Code Block: RI-B                                     (User may change)
*-----
*               Specify input/output folders & analysis name
*-----

* Where should the programs look for datasets?
global VCQI_DATA_FOLDER      ${MY_MADRID_VCQI_BF_DHS_DATASETS}

* Where should the programs put output?
global VCQI_OUTPUT_FOLDER    ${MY_MADRID_VCQI_BF_DHS_OUTPUT}/Demo_Run_00_Full_CRUDE_VALID

* Establish analysis name
* (used in log file name and Excel file name)

global VCQI_ANALYSIS_NAME RI
```

Block C – Start Clean Excel File & Log

```
*****
* Code Block: RI-C                                     (Do not change)
*-----
*               CD to output folder & open VCQI log
*-----

capture mkdir "${VCQI_OUTPUT_FOLDER}"

cd "${VCQI_OUTPUT_FOLDER}"

* Start with a clean, empty Excel file for tabulated output (TO)
capture erase "${VCQI_OUTPUT_FOLDER}/${VCQI_ANALYSIS_NAME}_TO.xlsx"

* Give the current program a name, for logging purposes
global VCP RI_Control_Program

* Open the VCQI log and put a comment in it
vcqi_log_comment $VCP 3 Comment "Run begins...log opened..."

* Document the global macros that were defined before the log opened
vcqi_log_global VCQI_DATA_FOLDER
vcqi_log_global VCQI_OUTPUT_FOLDER
vcqi_log_global VCQI_ANALYSIS_NAME

* Write an entry in the log file for each program, noting its version number

vcqi_log_all_program_versions
```

Block D – Datasets & Metadata

```
*****
* Code Block: RI-D                                     (User may change)
*-----
*               Specify dataset names and important metadata
*-----

* Name of datasets that hold RI data
vcqi_global VCQI_RI_DATASET      DHS_7_to_VCQI_RI_12_23
vcqi_global VCQI_RIHC_DATASET

* Name of dataset that holds cluster metadata
vcqi_global VCQI_CM_DATASET      DHS_7_to_VCQI_CM

* If you will describe the dataset using DESC_01 then you need to also specify
* the HH and HM datasets

vcqi_global VCQI_HH_DATASET      DHS_7_to_VCQI_HH
vcqi_global VCQI_HM_DATASET      DHS_7_to_VCQI_HM
```

Block D – Vaccination Schedule

```
scalar bcg_min_age_days          = 0  // birth dose
scalar opv0_min_age_days         = 0  // birth dose

* opv0 only given in the first two weeks of life
scalar opv0_max_age_days         = 14  // birth dose

scalar dpt1_min_age_days         = 56  // 8 weeks
scalar opv1_min_age_days         = 56  // 8 weeks

scalar dpt2_min_age_days         = 84  // 12 weeks
scalar dpt2_min_interval_days    = 28  // 4 weeks
scalar opv2_min_age_days         = 84  // 12 weeks
scalar opv2_min_interval_days    = 28  // 4 weeks

scalar dpt3_min_age_days         = 112 // 16 weeks
scalar dpt3_min_interval_days    = 28  // 4 weeks
scalar opv3_min_age_days         = 112 // 16 weeks
scalar opv3_min_interval_days    = 28  // 4 weeks

scalar mcv_min_age_days          = 270 // 9 months
```

Block D – Allowable Vaccination Dates

```
vcqi_global EARLIEST_SVY_VACC_DATE_M    5
vcqi_global EARLIEST_SVY_VACC_DATE_D    20
vcqi_global EARLIEST_SVY_VACC_DATE_Y    2008

vcqi_global LATEST_SVY_VACC_DATE_M      12
vcqi_global LATEST_SVY_VACC_DATE_D      29
vcqi_global LATEST_SVY_VACC_DATE_Y      2010
```

Block D – Register Records Sought?

```
* These are mutually exclusive, so only one
* | of them should be set to 1.
*
vcqi_global RI_RECORDS_NOT_SOUGHT          1
vcqi_global RI_RECORDS_SOUGHT_FOR_ALL      0
vcqi_global RI_RECORDS_SOUGHT_IF_NO_CARD  0
```

**Note that for many VCQI inputs,
0 means NO and 1 means YES**

Block D – Dose Names

```
* Note that these abbreviations must correspond to those used in the
* names of the dose date and dose tick variables. The variables are
* named using lower-case acronyms. The globals here may be upper or
* mixed case...they will be converted to lower case in the software.
*
vcqi_global RI_SINGLE_DOSE_LIST  bcg opv0 mcv
vcqi_global RI_MULTI_2_DOSE_LIST
vcqi_global RI_MULTI_3_DOSE_LIST dpt opv
```


Block D – Level 4 Stratifier?

```
* Variable to further stratify results by ... can be left blank
vcqi_global VCQI_LEVEL4_STRATIFIER urban_cluster
```

**Name of variable that is a
stratifier; usually an integer
with a value label
(factor variable)**

Block D – Which Strata in Tables

```
vcqi_global SHOW_LEVEL_1_ALONE 1
vcqi_global SHOW_LEVEL_2_ALONE 0
vcqi_global SHOW_LEVEL_3_ALONE 1
vcqi_global SHOW_LEVELS_2_3_TOGETHER 0

vcqi_global SHOW_LEVELS_1_4_TOGETHER 0
vcqi_global SHOW_LEVELS_2_4_TOGETHER 0
vcqi_global SHOW_LEVELS_3_4_TOGETHER 0
vcqi_global SHOW_LEVELS_2_3_4_TOGETHER 0

vcqi_global SHOW_BLANKS_BETWEEN_LEVELS 1
```

(Hint: See examples in VCQI User's Guide Annex B)

Block D – Strata Names & Table Order

```
vcqi_global LEVEL2_ORDER_DATASET ${VCQI_DATA_FOLDER}/level2order
vcqi_global LEVEL3_ORDER_DATASET ${VCQI_DATA_FOLDER}/level3order
vcqi_global LEVEL4_ORDER_DATASET ${VCQI_DATA_FOLDER}/level4order

vcqi_global LEVEL1_NAME_DATASET ${VCQI_DATA_FOLDER}/level1name
vcqi_global LEVEL2_NAME_DATASET ${VCQI_DATA_FOLDER}/level2names
vcqi_global LEVEL3_NAME_DATASET ${VCQI_DATA_FOLDER}/level3names
vcqi_global LEVEL4_NAME_DATASET ${VCQI_DATA_FOLDER}/level4names
```

(Hint: See examples in VCQI User's Guide Annex B)

Block D – CI Calculation Method

- * User specifies the method for calculating confidence intervals
- * Valid choices are LOGIT, WILSON or CLOPPER; our default
- * recommendation is WILSON.

```
vcqi_global VCQI_CI_METHOD WILSON
```

Block D – Excel Options

```
* Specify whether the code should export to excel, or not (usually 1)
vcqi_global EXPORT_TO_EXCEL          1

* The code to format excel is a little slow, so give an option to turn it off
* when debugging (usually 1)
vcqi_global FORMAT_EXCEL              1
```

Block D – Plot Options

```
* Specify whether the code should make plots, or not (usually 1)

* MAKE_PLOTS must be 1 for any plots to be made
vcqi_global MAKE_PLOTS                1

* Make inchworm plots? Set to 1 for yes.
vcqi_global VCQI_MAKE_IW_PLOTS        1

* Make unweighted sample proportion plots? Set to 1 for yes.
vcqi_global VCQI_MAKE_UW_PLOTS        1

* Make organ pipe plots? Set to 1 for yes.
vcqi_global VCQI_MAKE_OP_PLOTS        1
```

Block D – Plot Options

```
* Save the data underlying each organ pipe plot? Set to 1 for yes.

vcqi_global VCQI_SAVE_OP_PLOT_DATA          1

* Specify whether the code should save Stata .gph files when making plots.
* Usually 0. These files are only made if MAKE_PLOTS is 1.
* Set to 1 if you want to be able to edit plots in the Stata Graph Editor
* or re-export them in a different size or graphic file format.

vcqi_global SAVE_VCQI_GPH_FILES             1
```

Block D – Delete Databases & Temp Datasets

```
vcqi_global DELETE_VCQI_DATABASES_AT_END    0

* Specify whether the code should delete intermediate datasets
* at the end of the analysis (Usually 1)

vcqi_global DELETE_TEMP_VCQI_DATASETS       0
```

1 means delete them and 0 means keep them.

The temp datasets include augmented datasets & inchworm and unweighted plot parameter files (& others).

Block D – Check User Inputs

- * For the RI analysis, also evaluate
- * completeness and concordance of vaccination evidence

```
vcqi_global VCQI_CHECK_INSTEAD_OF_RUN 0
```

**1 means do not run, but instead check all user inputs;
0 means check the inputs and run the code**

(It can be sad to have the code find a problem in your inputs 1 hour into a long run...so maybe do a quick check before running a big job...)

Block D – Summarize RI Data Quality

- * For RI analysis, there is an optional report on data quality
- * Set this global to 1 to generate that report
- * It appears in its own separate Excel spreadsheet

```
vcqi_global VCQI_REPORT_DATA_QUALITY 1
```

If 1, this generates a second spreadsheet with your analysis name and then a suffix: _dates_tick.xlsx

If 0, it skips this step. I run this once and then turn it off.

Block E – Pre-process Survey Data

```
*****
* Code Block: RI-E                                     (Do not change)
*-----
*               Format the VCQI dose list and pre-process survey data
*-----
```

Code omitted here...see control program...

Block F – Run Indicators

```
*****
* Code Block: RI-F                                     (User may change)
*-----
*               Calculate VCQI indicators requested by the user
*-----

* This is a counter that is used to name datasets...it is usually set to 1 but
* the user might change it if requesting repeat analyses with differing
* parameters - see the User's Guide

vcqi_global ANALYSIS_COUNTER 1
```

Note that this 1 is not a yes...it is a counter...usually leave this at 1...watch for tutorial on advanced uses

Block F – Titles & Footnotes

```
* Estimate crude dose coverage for all the doses in the RI_DOSE_LIST
vcqi_global RI_COVG_01_TO_TITLE      Crude Coverage
vcqi_global RI_COVG_01_TO_SUBTITLE
vcqi_global RI_COVG_01_TO_FOOTNOTE_1  Abbreviations: CI=Confidence Interval;
vcqi_global RI_COVG_01_TO_FOOTNOTE_2  Note: This measure is a population est
RI_COVG_01
```

These titles & footnotes appear in Excel tables; user currently doesn't have control over titles & notes on plots; we can change that...

Block F – Some Indicators Have Inputs

```
* Estimate proportion of respondents fully vaccinated
vcqi_global RI_DOSES_TO_BE_FULLY_VACCINATED BCG DPT1 DPT2 DPT3 OPV1 OPV2 OPV3 MCV

vcqi_global RI_COVG_03_TO_TITLE      Fully Vaccinated
vcqi_global RI_COVG_03_TO_SUBTITLE
vcqi_global RI_COVG_03_TO_FOOTNOTE_1  Abbreviations: CI=Confidence Interval; LCB=Lower
vcqi_global RI_COVG_03_TO_FOOTNOTE_2  Note: This measure is a population estimate that
vcqi_global RI_COVG_03_TO_FOOTNOTE_3  Note: To be considered fully vaccinated, the chil
RI_COVG_03
```

Inputs are documented in the User's Guide

VCQI checks for missing inputs and does some checking for valid values...error messages are hopefully helpful

Block F – Some Have Several Inputs

```
* -----  
* Identify clusters with alarmingly low coverage of BCG MCV OPV1 or DPT1  
  
vcqi_global RI_COVG_05_DOSE_LIST BCG MCV OPV1 DPT1  
  
* Specify whether to make one table listing only the clusters with low  
* coverage (ONLY_LOW_CLUSTERS)  
* or to make one table per stratum, listing all clusters and highlighting  
* those with low coverage (ALL_CLUSTERS)  
vcqi_global RI_COVG_05_TABLES ONLY_LOW_CLUSTERS  
  
* Specify whether alarmingly low coverage is defined by an absolute  
* number of respondents vaccinated (COUNT) or by percent of respondents  
* in the cluster (PERCENT)  
vcqi_global RI_COVG_05_THRESHOLD_TYPE COUNT
```

Block F – RI_COVG_05 Continued

```
* Specify the threshold that defines alarmingly low  
* A count, like 0, 1, 2 if the THRESHOLD_TYPE is COUNT  
* A percent 0 up to 100 if the THRESHOLD_TYPE is PERCENT  
  
* Clusters whose coverage is <= the threshold will be flagged  
* as having alarmingly low coverage.  
vcqi_global RI_COVG_05_THRESHOLD 2
```


Block F – Some Footnotes Are Automagic

```
if "`=upper("$RI_COVG_05_TABLES")'" == "ALL_CLUSTERS" ///
    vcqi_global RI_COVG_05_TO_FOOTNOTE_1 Note: Shaded rows have alarmingly low

if "`=upper("$RI_COVG_05_TABLES")'" == "ONLY_LOW_CLUSTERS" ///
    vcqi_global RI_COVG_05_TO_FOOTNOTE_1 Note: Each row has alarmingly low cov

if "`=upper("$RI_COVG_05_THRESHOLD_TYPE")'" == "COUNT" ///
    local criterion_string N who received at least one dose in the list <= ${R

if "`=upper("$RI_COVG_05_THRESHOLD_TYPE")'" == "PERCENT" ///
    local criterion_string the weighted % who received at least one dose in the
```

Block G – Cleanup

```
*****
* Code Block: RI-G                                     (Do not change)
*-----
*                               Exit gracefully
*-----
*
vcqi_cleanup
```

**Cleans up log file; deletes
files unless user has asked
to keep them; prints logo and
number of errors**

Block F – Missing Details

- See example control programs and see templates in your VCQI folder named CONTROL
- See Chapter 7 of the VCQI User's Guide

Key Points

- Datasets & control program hold everything that is survey-specific
- Library of 200+ VCQI programs are called by control program – those programs are generic and re-usable and testable
- Easy to add additional indicators (watch for tutorial)
- Designed for flexibility in how strata are listed & what types of outputs are saved (or even calculated)

Limitations

- Must run Stata 14+
- Need to formalize documentation of testing & advice for testing new modules
- Can only handle one level4 stratifier at a time now
- Titles & notes for figures are not as flexible as those for tables
- Inchworms & unweighted plots color by level, not to classify

Not Covered Here

- Indicators for summarizing results of multiple choice question
 - Education, religion, literacy
 - Reasons for non-vaccination
- Indicators for comparing coverage
 - Between strata
 - Between subgroups within a stratum
- Tool for translating DHS & MICS to VCQI compatible
- Advice for translating YOUR dataset to VCQI compatible

Not Covered Here

- Existing stand-alone programs in Stata & R to generate organ pipe plots
- Existing stand-alone program in Stata to generate inchworm plots