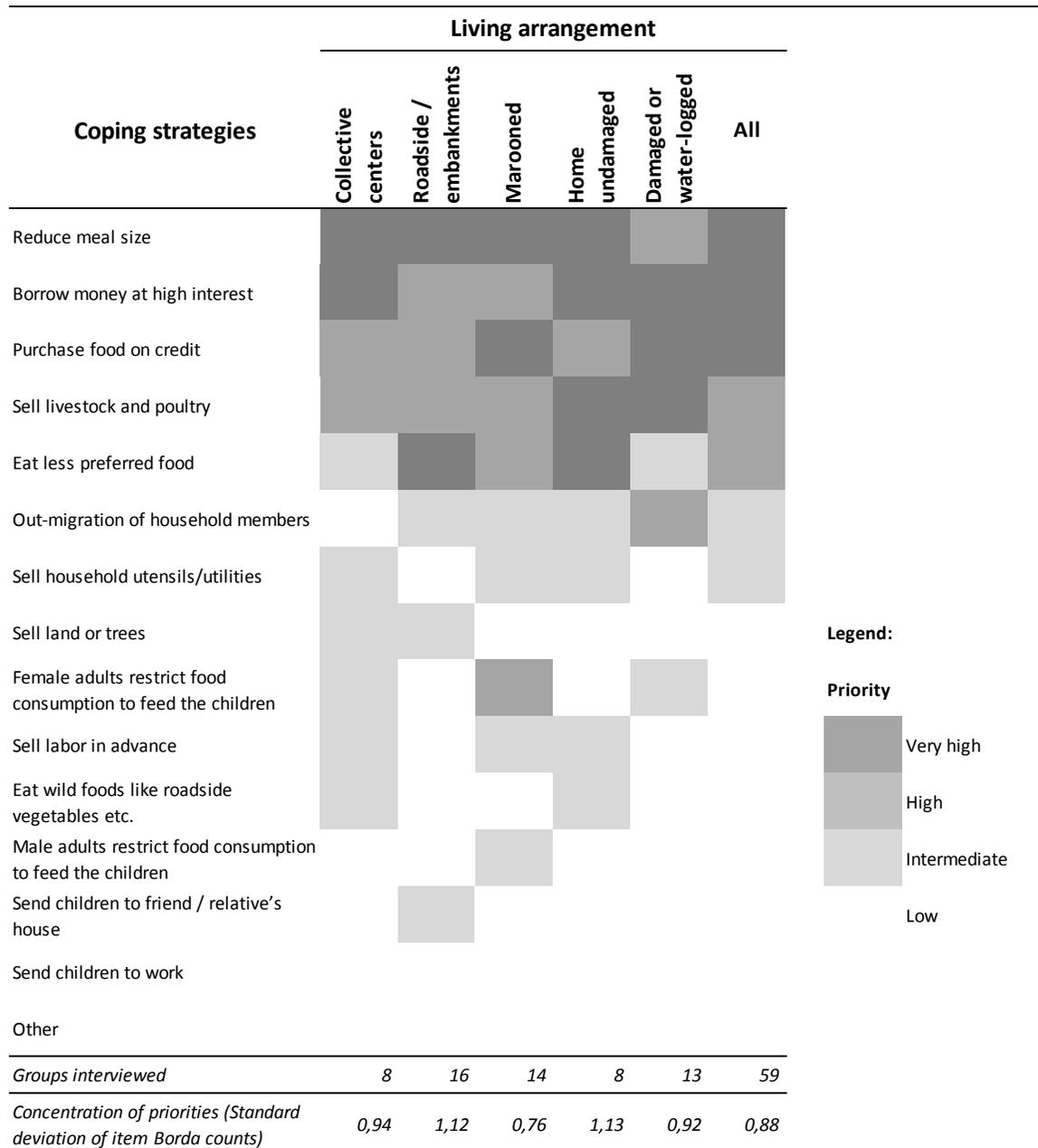Aldo Benini

Heat maps as tools to summarize priorities expressed in needs assessments

A note for Acaps

Coping strategies	Living arrangement					
	Collective centers	Roadside / embankments	Marooned	Home undamaged	Damaged or water-logged	All
Reduce meal size						
Borrow money at high interest						
Purchase food on credit						
Sell livestock and poultry						
Eat less preferred food						
Out-migration of household members						
Sell household utensils/utilities						
Sell land or trees						
Female adults restrict food consumption to feed the children						
Sell labor in advance						
Eat wild foods like roadside vegetables etc.						
Male adults restrict food consumption to feed the children						
Send children to friend / relative's house						
Send children to work						
Other						
Groups interviewed	*8*	*16*	*14*	*8*	*13*	*59*
Concentration of priorities (Standard deviation of item Borda counts)	*0,94*	*1,12*	*0,76*	*1,13*	*0,92*	*0,88*

Legend:

Priority

Very high

High

Intermediate

Low

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Summary

Needs assessments in disaster-affected communities produce data that express priorities or ordered preferences, such as about urgent needs, or preferred coping strategies. When the items are ranked (and not just independently rated), summary priority measures can be validly computed as sums or averages of the concerned individual values. The validity is derived from the theory of election systems, specifically the so-called Borda count.

Visualizing differences in the priority measures by respondents (e.g. affected communities) or by items (e.g. sectors) is done in a second step. When the number of items or groups to distinguish is considerable, traditional methods like clustered bar charts overwhelm the cognitive capacity of the reader.

Heat maps, pseudo-charts that in essence are colored tables, offer an easier-to-understand alternative. This note demonstrates the steps needed to make such maps, using data that an Acaps assessment generated in a flood zone in Bangladesh. Depending on analytic interest, several flavors of heat maps are feasible. As an additional example, we visualize the *relative* importance of coping strategies across affected groups, by rating the group-specific item scores to the all-sample averages.

The total number of assessed communities may be small. Special care then has to be taken to safeguard against unrecognized influences of small changes in individual preferences and their possibly considerable effects on the ranking of items or groups. This is a challenge that the quantitative treatment of data that fundamentally originated as qualitative information faces everywhere - and also in the interpretation of heat maps used in needs assessments.

Introduction

Needs assessments in disaster-affected communities produce, among other data, some that express priorities or ordered preferences, such as about urgent needs, or preferred coping strategies. They result from a multiple-response generating process, through

- interviews that use questions so designed, or
- some participatory appraisal tool, or even
- the aggregation, by assessment teams, of lower level responses to a ranking of items at the higher level.

This third mechanism would generate, for example, a statement like "From several key informant conversations, we found that the most popular type of toilet in the community was XX, followed by YY and ZZ." The data are then formally managed and analyzed with the aim of describing differences in priorities and preferences, such as among types of communities or among items (needs, sectors, intervention options).

Typically these data arrive as ordinal data, with the first priority assigned the value 1, the second 2, etc. Items that were not chosen within the multiple-response format are left blank; thus it is clear only at second glance whether the item was not a priority, or the respondent did not answer this set of questions (all missing values). For example, data generated with the Humanitarian Emergency Settings Perceived Needs Scale (HESPER) (WHO and King's College London 2011: 50 and 59) is likely to be entered in this format.

Data managers sometimes assign inverse rankings to the named priorities, e.g. the value 3 for the first priority when the questions permit up to three choices. This is a precondition for treating this type of data by means of Borda counts - a weighted count of ranking votes (Benini 2011; Wikipedia 2011a). Practically, we compute the itemwise sum or mean of the (inverted) ranks over the respondents. This is done by first re-coding missing values (non-priority items) as zeros in all respondents who answered the set of questions in point.

When the set of items is large and/or the number of respondent subgroups to distinguish is considerable, some types of visualization quickly grow unwieldy. Frequently, such findings are presented in clustered-bar charts. These may cognitively overburden the reader.

This note offers an alternative representation, in the shape of a table with shaded cells. It looks like a graph - a simple version of a "heat map". Heat maps are tables with cells that hold numbers. However, the numbers are expressed primarily by color (Wikipedia 2011b), with or without accompanying numericals. A particular color represents a point value (e.g. when the dependent variable is composed of a few integers only) or, more commonly, a range of values.

Heat maps are easy to read and interpret. Nevertheless, the reader needs to understand, from suitable captions or footnotes, the analytic intent. This note demonstrates the process from data to heat map by example and discussion.

An Excel demonstration workbook is offered. We assume that the reader is an Excel user at an intermediate skill level, to the point of understanding R1C1 style, absolute, relative and mixed cell references as well as composite functions with IF.

Illustration: Coping strategies among flood survivors

An Acaps-led assessment team in Bangladesh (Acaps and al. 2011) interviewed 63 groups of people affected by floods in their temporary living arrangements. The interviews established the groups' priorities for their immediate coping strategies. Six types of temporary living arrangements, and fourteen different coping strategies were distinguished (plus a 15th for "other").

The data manager held the priority values in the (efficient) inverse order, although without assigning zeros to non-prioritized strategies. Values were condensed in the following chart, which details the importance of different strategies by current living arrangement. The importance metric is not noted in the chart. We do not know whether it is based on a Borda count (the sum of rankings over all groups) or on some other function. A look at the data table shows that the maximum priority value is 5 (meaning: from each interviewed group up to five priority strategies were elicited); thus the height of the bars may represent mean Borda counts, with half point steps between the gridlines.

[Page 32 of original report:] Figure 21: Coping strategies reported per living arrangement
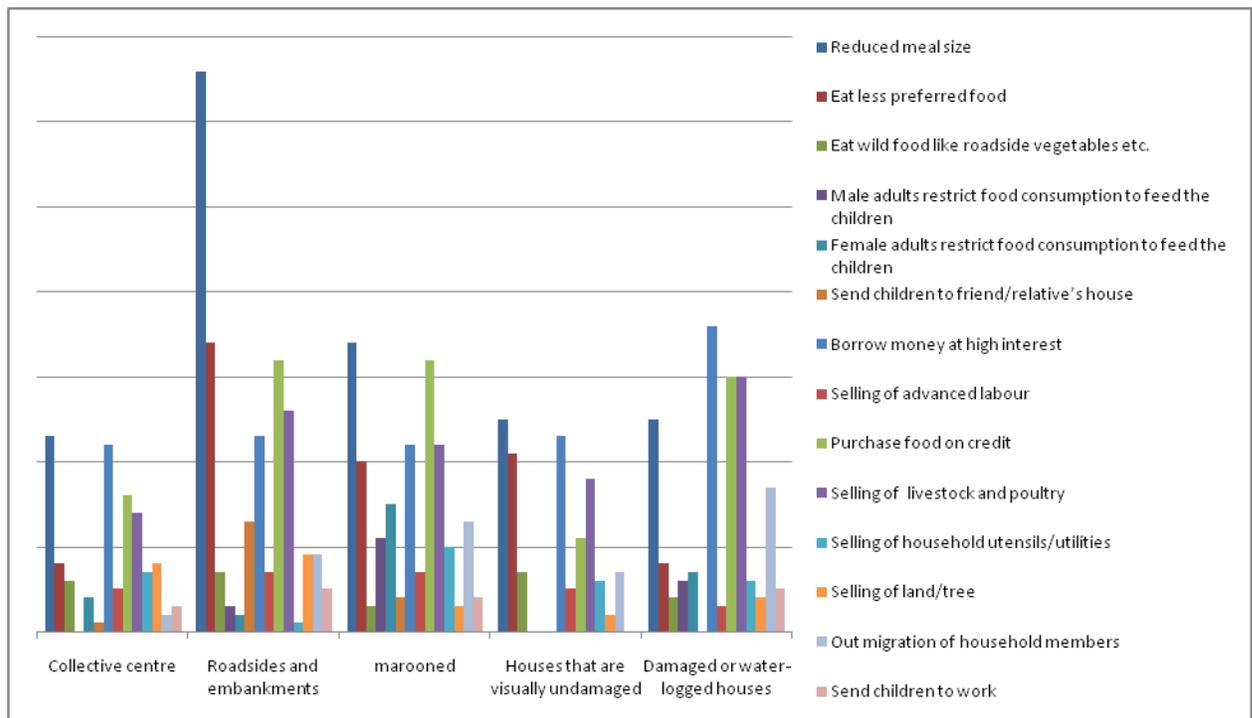
Alternative treatment

While this chart is clean and well organized, the zigzagging of differently colored bars makes it nevertheless difficult to assimilate the key message. The viewer immediately catches on to the tallest bar, the dark blue in the second left-most cluster. It says that groups stranded on roadsides and embankments greatly tend to reduce the size of their meals. The remainder of the information is hard to decipher.

An alternative treatment, within the Excel spreadsheet application, uses a tabular strategy - one paradoxically known as "heat map". The heat map may look like a map of sorts, but it is still essentially a table, thus, if you will, a "pseudo-chart".

Its principal tools are IF-functions (to recode non-priorities into zeros), Pivot tables and conditional formatting. In the end, when copying into a report document, a gray-shaded pseudo-chart - in reality a table - results. The process, once a properly formatted data table is available, may take about 20 minutes.

Steps to create the heat map

Document variables

While each coping strategy may warrant a verbal description of adequate length, efficient data management calls for relatively short variable names. Here, dealing with coping strategies, we name the variables in brief notation as C1, C2 up to C15 (C for coping). We display these names together with their labels in a separate sheet documenting the variables (regardless of the heat map process, it is always good policy to document the variables in a sheet separate from the data table. If a properly formatted data table already exists, we use Copy - Paste (Transpose) to accelerate the creation of the "Variables" sheet). Part of this sheet looks like:

ColNo	VarName	OrigLabel	Comment
1	RecNo	00.02 number	
2	Date	00.03 Date	
3	Team	00.04 Team Number	
4	District	00.05 District	
5	Upazila	00.06 Upazilla	
6	Union	00.07 Union	
7	RurUrban	00.08 Urban / Rural	
8	Village	00.09 Village	
9	LivingArr	00.10 Living Arrangement	
22	C1	16.01 Reduced meal size	Coping strategy
23	C2	16.02 Eat less preferred food	Coping strategy
24	C3	16.03 Eat wild food like roadside vegetables etc.	Coping strategy
25	C4	16.04 Male adults restrict food consumption to feed the children	Coping strategy

26	C5	16.05 Female adults restrict food consumption to feed the children	Coping strategy
27	C6	16.06 Send children to friend/relative's house	Coping strategy
28	C7	16.07 Borrow money at high interest	Coping strategy
29	C8	16.08 Selling of advanced labour	Coping strategy
30	C9	16.09 Purchase food on credit	Coping strategy
31	C10	16.10 Selling of livestock and poultry	Coping strategy
32	C11	16.11 Selling of household utensils/utilities	Coping strategy
33	C12	16.12 Selling of land/tree	Coping strategy
34	C13	16.13 Out migration of household members	Coping strategy
35	C14	16.14 Send children to work	Coping strategy
36	C15	16.15 Others (specify)	Coping strategy

where ColNo is the number of the column in which the variable is held in the data table, in R1C1-style. Columns 10 - 21 hold other variables; they are not of interest for our purpose. The numeric prefixes in the labels refer to the position of questions and items in the questionnaire or check-list. They should ultimately be edited out for esthetic reasons. In countries where the questionnaire is printed in a national language, but where data entry and analysis proceed in a foreign idiom not shared by all the team members, question numbers should be part of the variables documentation[1].

Count the items prioritized

In the data sheet, create an auxiliary variable CountCoping and use a formula like

$$=COUNT(RC[-17]:RC[-3])$$

if RC[-17]:RC[-3] is the range holding the priority data in the record, or adjust the range as needed. If the result is zero, this means that the respondent did not answer any in the set of question in point, and the values are all to be treated as missing.

In our demo workbook, this variable is stored in column 39 of the data table, thus

39	CountCoping	Count of non-blank cells in Coping strategies

Recode the priority variables

We need to recode the priority variables such that the first priority gets the highest value, and non-priority items are set to zero. If a group did not respond to any priority questions, we do not want zeros, but blanks. For this purpose, create fields in the data table for a recoded variable for each of the priority variables. Name them using a different prefix such as "Czero" (C for coping, zero for the act of setting non-priority items to zero):

---

[1] The tedium of deleting prefixes can be reduced by recreating labels in a separate column of the Variables sheet, with a composite function like =TRIM(SUBSTITUTE(RC[-3],LEFT(RC[-3],6),,1)), where the cell referenced by RC[-3] holds the prefixed original, LEFT(RC[-3],6) grabs the first six characters thereof, the two commas with nothing in-between say to replace the six with nothing (= delete them), and the final argument with value 1 here refers to the first instance. TRIM removes leading or trailing spaces.

ColNo	VarName	OrigLabel	Comment
52	Czero1	16.01 Reduced meal size	Coping strategy
53	Czero2	16.02 Eat less preferred food	Coping strategy
54	Czero3	16.03 Eat wild food like roadside vegetables etc.	Coping strategy
55	Czero4	16.04 Male adults restrict food consumption to feed the children	Coping strategy
56	Czero5	16.05 Female adults restrict food consumption to feed the children	Coping strategy
57	Czero6	16.06 Send children to friend/relative's house	Coping strategy
58	Czero7	16.07 Borrow money at high interest	Coping strategy
59	Czero8	16.08 Selling of advanced labour	Coping strategy
60	Czero9	16.09 Purchase food on credit	Coping strategy
61	Czero10	16.10 Selling of livestock and poultry	Coping strategy
62	Czero11	16.11 Selling of household utensils/utilities	Coping strategy
63	Czero12	16.12 Selling of land/tree	Coping strategy
64	Czero13	16.13 Out migration of household members	Coping strategy
65	Czero14	16.14 Send children to work	Coping strategy
66	Czero15	16.15 Others (specify)	Coping strategy

The recoding formula to be used depends on how the priority values in the original variables were handled:

If the priority values have already been inverted (i.e. the first priority item is marked with the highest number, e.g. 3, equal to the number of options allowed), recode using a formula like

$$=IF(RC39=0, "", IF(ISBLANK(RC[-30])=TRUE, 0, RC[-30]))$$

where RC39 refers to the cell that holds the count of non-blank cells in the original coping strategy variables in this record. Note the <u>mixed</u> reference, with an absolute column number to preserve the column when the formula is right-side-copied, and a relative row reference to move with the records when copying downwards. The function ensures that if the value is genuinely missing, it remains so; if the original was blank but the respondent did participate, it will be set to zero. Else the original value is copied, as in the last term. Note that RC[-30] is a <u>relative</u> reference type, to efficiently right-side copy over the entire set of recoded priority variables. "-30" in our case means that variable C1 is held 30 columns to the left of Czero1, the destination column, etc. Obviously, such references have to be adjusted as per the set-up of one's datasheet.

If the priority values need inversion (i.e. when the first priority was entered as 1), we invert them by adjusting the formula like:

$$=IF(RC39=0, "", IF(ISBLANK(RC[-30])=TRUE, 0, \textit{[number of permitted choices + 1]} - RC[-30]))$$

In our data, as a result of setting truly missing values to blanks, we find that out of the 63 originally interviewed groups, 59 supplied preferred coping strategy data.

Compute mean Borda counts

The mean of the Borda counts, itemwise, is computed in a Pivot table, using the recoded variables, and placing the group variable on which we stratify in the column heading. In our example, we stratify on the groups' living arrangements. The cell values are simply the group-wise averages of the recoded variables:

Values	LivingArr 1-Center	2-HighGround	3-Marooned	4-HomeUnaff	5-HomeDamag	6-Other	Grand Total
Average of Czero1	2.88	4.13	2.43	3.13	1.92	0.00	2.88
Average of Czero2	1.00	2.13	1.43	2.63	0.62	0.00	1.52
Average of Czero3	0.75	0.44	0.21	0.88	0.31	0.00	0.45
Average of Czero4	0.00	0.19	0.79	0.00	0.46	0.00	0.33
Average of Czero5	0.50	0.13	1.07	0.00	0.54	0.00	0.47
Average of Czero6	0.13	0.81	0.29	0.00	0.00	0.00	0.30
Average of Czero7	2.75	1.44	1.57	2.88	2.77	5.00	2.18
Average of Czero8	0.63	0.44	0.50	0.63	0.23	1.00	0.47
Average of Czero9	2.00	2.00	2.29	1.38	2.31	2.00	2.05
Average of Czero10	1.75	1.63	1.57	2.25	2.31	4.00	1.90
Average of Czero11	0.88	0.06	0.71	0.75	0.46	0.00	0.50
Average of Czero12	1.00	0.56	0.21	0.25	0.31	3.00	0.48
Average of Czero13	0.25	0.56	0.93	0.88	1.31	0.00	0.80
Average of Czero14	0.38	0.31	0.29	0.00	0.38	0.00	0.28
Average of Czero15	0.00	0.00	0.00	0.13	0.23	0.00	0.07

Rearrange the table

To continue processing this information, we take a values-only copy of the Pivot table and place it in a separate sheet. We insert meaningful variable labels, since names such as Czero1 mean nothing to the reader. A left-side auxiliary variable named OrigSortOrder with sequence 1,2, etc. ensures that the original sort order can conveniently be recreated if we feel the need after sorting on any other column. This image shows the five left-most columns of this table only:

OrigSortOrd	RecodedVariable	OrigVarLabel	1-Center	2-HighGround
1	Czero1	Reduce meal size	2.88	4.13
2	Czero2	Eat less preferred food	1.00	2.13
3	Czero3	Eat wild foods like roadside vegetabl	0.75	0.44
4	Czero4	Male adults restrict food consumptio	0.00	0.19
5	Czero5	Female adults restrict food consumpt	0.50	0.13
6	Czero6	Send children to friend / relative's hc	0.13	0.81
7	Czero7	Borrow money at high interest	2.75	1.44
8	Czero8	Sell labor in advance	0.63	0.44
9	Czero9	Purchase food on credit	2.00	2.00
10	Czero10	Sell livestock and poultry	1.75	1.63
11	Czero11	Sell household utensils/utilities	0.88	0.06
12	Czero12	Sell land or trees	1.00	0.56
13	Czero13	Out-migration of household member	0.25	0.56
14	Czero14	Send children to work	0.38	0.31
15	Czero15	Other	0.00	0.00

Sort by mean item Borda count

We take another copy of this table into a different sheet and sort, descendingly, on the mean Borda count for the entire sample (called "All" in the rightmost column). This image hides columns 5 to 9 for space reasons here, but the hidden variables get sorted along.

	1	2	3	4	10
1	OrigSortOrd	RecodedVariable	OrigVarLabel	1-Center	All
2	1	Czero1	Reduce meal size	2.88	2.88
3	7	Czero7	Borrow money at high interest	2.75	2.18
4	9	Czero9	Purchase food on credit	2.00	2.05
5	10	Czero10	Sell livestock and poultry	1.75	1.90
6	2	Czero2	Eat less preferred food	1.00	1.52
7	13	Czero13	Out-migration of household member	0.25	0.80
8	11	Czero11	Sell household utensils/utilities	0.88	0.50
9	12	Czero12	Sell land or trees	1.00	0.48
10	5	Czero5	Female adults restrict food consumpt	0.50	0.47
11	8	Czero8	Sell labor in advance	0.63	0.47
12	3	Czero3	Eat wild foods like roadside vegetabl	0.75	0.45
13	4	Czero4	Male adults restrict food consumptio	0.00	0.33
14	6	Czero6	Send children to friend / relative's hc	0.13	0.30
15	14	Czero14	Send children to work	0.38	0.28
16	15	Czero15	Other	0.00	0.07

Color cells by conditional formatting

Conditional formatting is used, in the next step, in order to visually differentiate cells by ranges of values. Here we use increasingly dark gray tones for cells with values in the ranges: 0 - 0.5 (=white), 0.5 - 1, 1 - 2, > 2 (= dark gray). A gray color ramp is particularly

appropriate if the report later will be disseminated among interested parties that may not have access to color printing.

The formatting rules can be inspected and, if needed, modified in the Conditional Formatting Rules Manager:
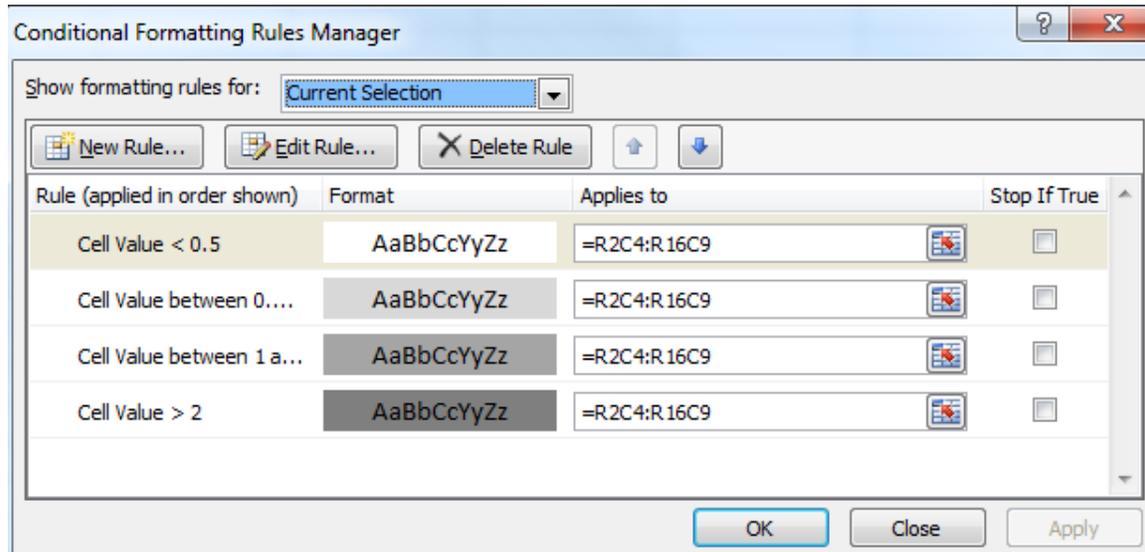
In this image the first two columns of the worksheet are not shown, again for space reasons:

OrigVarLabel	1-Center	2-HighGround	3-Marooned	4-HomeUnaff	5-HomeDamag	All
Reduce meal size	2.88	4.13	2.43	3.13	1.92	2.88
Borrow money at high interest	2.75	1.44	1.57	2.88	2.77	2.18
Purchase food on credit	2.00	2.00	2.29	1.38	2.31	2.05
Sell livestock and poultry	1.75	1.63	1.57	2.25	2.31	1.90
Eat less preferred food	1.00	2.13	1.43	2.63	0.62	1.52
Out-migration of household member	0.25	0.56	0.93	0.88	1.31	0.80
Sell household utensils/utilities	0.88	0.06	0.71	0.75	0.46	0.50
Sell land or trees	1.00	0.56	0.21	0.25	0.31	0.48
Female adults restrict food consumpt	0.50	0.13	1.07	0.00	0.54	0.47
Sell labor in advance	0.63	0.44	0.50	0.63	0.23	0.47
Eat wild foods like roadside vegetabl	0.75	0.44	0.21	0.88	0.31	0.45
Male adults restrict food consumptio	0.00	0.19	0.79	0.00	0.46	0.33
Send children to friend / relative's ho	0.13	0.81	0.29	0.00	0.00	0.30
Send children to work	0.38	0.31	0.29	0.00	0.38	0.28
Other	0.00	0.00	0.00	0.13	0.23	0.07

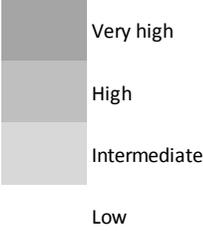## Reformat for the final table

In the next step, we reformat for a table that is more legible, with proper row and column variable names. Earlier, we gave the living arrangements names numeric prefixes, to force the same sequence as in the original assessment chart; we now remove them and replace the labels with more meaningful ones. We eliminate the coping strategy option "Other" because of insignificance (one respondent only). We widen the rows and narrow

the columns in order to get a better visual balance between living arrangements and copying strategies. We achieve this by aligning the column headers vertically.

Additional table features

At the bottom of the table, we add a row for the subsample sizes. To facilitate interpretation, the standard deviation over the coping strategy mean Borda counts is computed, as a (crude) measure of concentration of priorities within those groups of a given living arrangement.

A legend is added, with verbal intensity values for the gray shades, e.g. "Very high priority" for dark gray, etc.

| Coping strategies | Living arrangement | | | | | |
	Collective centers	Roadside / embankments	Marooned	Home undamaged	Damaged or water-logged	All
Reduce meal size	2.88	4.13	2.43	3.13	1.92	2.88
Borrow money at high interest	2.75	1.44	1.57	2.88	2.77	2.18
Purchase food on credit	2.00	2.00	2.29	1.38	2.31	2.05
Sell livestock and poultry	1.75	1.63	1.57	2.25	2.31	1.90
Eat less preferred food	1.00	2.13	1.43	2.63	0.62	1.52
Out-migration of household members	0.25	0.56	0.93	0.88	1.31	0.80
Sell household utensils/utilities	0.88	0.06	0.71	0.75	0.46	0.50
Sell land or trees	1.00	0.56	0.21	0.25	0.31	0.48
Female adults restrict food consumption to feed the children	0.50	0.13	1.07	0.00	0.54	0.47
Sell labor in advance	0.63	0.44	0.50	0.63	0.23	0.47
Eat wild foods like roadside vegetables etc.	0.75	0.44	0.21	0.88	0.31	0.45
Male adults restrict food consumption to feed the children	0.00	0.19	0.79	0.00	0.46	0.33
Send children to friend / relative's house	0.13	0.81	0.29	0.00	0.00	0.30
Send children to work	0.38	0.31	0.29	0.00	0.38	0.28
Other	0.00	0.00	0.00	0.13	0.23	0.07
Groups interviewed	*8*	*16*	*14*	*8*	*13*	*59*
Concentration of priorities (Standard deviation of item Borda counts)	*0.94*	*1.12*	*0.76*	*1.13*	*0.92*	*0.88*

Legend:

Priority

	Very high
	High
	Intermediate
	Low

Remove the numbers in the heat map cells

Users of heat maps are divided as to whether the values in the cells should remain visible. Some find them informative and necessary for true disclosure; others consider them visually disturbing elements that frustrate the reason for being of the heat map, which is to offer a rapid, unencumbered view of x,y-combinations with the values of a third variable, z, that are within ranges of special interest.

If the choice is to render the values invisible: again we work in conditional formatting, selecting the range of cells to show background color, but no values and adjust the font color to be the same as the background. The result is shown on the title page.

When heat maps are relatively small (fewer rows than this), it may be more convenient to make the cell values invisible *after* copying the table into Word. We may simply delete them there, or set them to "Font: Hidden", an option that Excel does not offer directly.

For larger tables, including this one, we do the final editing in Excel, copy the entire table and paste it into Word as a picture.

Analytic interests

The formal interpretation of the above heat map runs in two dimensions. In the vertical, the table is arranged by the importance (= the averaged priority scores) of the strategies, in descending order for the whole sample. Gray shade reversals within a column indicate that this strategy holds an importance for people of this living arrangement that notably deviates from the sample average. For example, towards the center of the map, an island of middle-gray stands out. It signals that, for whatever reason, groups that are marooned place higher emphasis on adult women saving food for their children.

In the horizontal, the "heat" can be felt as expressing differences among groups, given the particular strategy. For example, eating less preferred foods has a particularly high priority for people stranded on roadsides and embankments, but - surprisingly - also for those whose homes show no visible damage.

The *substantive* interpretation of this table is beyond the concern of this paper. Nevertheless note, for example, that the 16 groups stranded on roads and embankments are the only ones that expressed neither "Borrow money" nor "Purchase food on credit" as very high priorities.

Plausibly these are among the poorest households. They know that their creditworthiness is low, and thus prioritize other coping strategies. Such and other interpretive elements would, of course, have to be given by those who know this population *and* the data about them. But a succinct pseudo-chart, or colored table, may facilitate the interpretation - visually as well as for those who write out conclusions.

Nevertheless, let us pause for a moment, reformulating what we just said a few paras above. If we look at the heat map with visible cell values, we are reminded that the cell value is the mean Borda count (mean inverted priority value) for the particular coping

strategy as well as for the groups in the particular temporary living arrangement. The mean is based also on the zeros, meaning the response by groups who did not assign any priority to a particular coping strategy.

In this construction, the table is balanced between strategies and living arrangements. Nevertheless, because we sorted vertically on strategies, in the visual impression the strategies take a leading role. Basically the upper half is dominated by darker shades, the lower by lighter ones. Thus we tend to notice vertical differences, but less so horizontal ones.

However, depending on assessment concerns, horizontal profiling might be especially revealing. This is called for when we wish to compare groups for their coping strategies, and to do so with a heat map that emphasizes these more starkly.

For this purpose, it may be appropriate to consider how far the mean preference for a particular coping strategy in a given group (here by living arrangements) deviates from the total sample. A plausible - perhaps not the best - approximation is by the ratio of the group's mean preference to the total sample mean, item by item. For example, people stranded on roadsides and embankments gave considerably higher priority (mean Borda count = 4.1) to reducing the size of their meals than the full sample of groups did (2.9).

The following table expresses relative priorities - relative to the entire sample of the 59 groups responding. However, one has to be careful about items with relatively low mean Borda counts for the 59 groups. A small change in the denominator can easily move the ratio to a point where the heat map would show a significantly different range. In our example, therefore, we will exclude (arbitrarily) items that earlier scored mean Borda counts of less than 0.50. These leaves us with seven coping strategies only. These we compare for their relative importance by living arrangement group.

We sort again descendingly, but this time not on the values of the total sample (they are all = 1), but arbitrarily on one of the specific groups. We choose the people stranded on roadsides and embankments because they have proven to be the poorest in many affected communities. Also we adjust the ranges for more meaningful color discrimination.

The result appears on the next page:

Coping strategies (relative importance for the group compared to all sample groups)	**Living arrangement**						
	Collective centers	Roadside / embankments	Marooned	Home undamaged	Damaged or water-logged		
Reduce meal size	1.00	1.43	0.84	1.08	0.67	**Legend:**	
Eat less preferred food	0.66	1.40	0.94	1.73	0.41	**Relative importance:**	
Purchase food on credit	0.98	0.98	1.11	0.67	1.13	> 1.5	Very high
Sell livestock and poultry	0.92	0.86	0.83	1.18	1.21	1 - 1.5	High
Out-migration of household members	0.31	0.70	1.16	1.09	1.63	0.5 - 1	Intermediate
Borrow money at high interest	1.26	0.66	0.72	1.32	1.27	0 - 0.5	Low
Sell household utensils/utilities	1.75	0.13	1.43	1.50	0.92		
Groups interviewed	*8*	*16*	*14*	*8*	*13*		

The result suggests that for those living on roadsides and embankments, immediate food-related strategies have greater relative importance. At the other extreme, most households stuck in this living arrangement have no utensils to spare, and thus do not give this option a high priority compared to the priorities that other groups give it.

This arrangement, built on ratios of priority scores (the ratio between group value and total-sample value) is thus suitable to discern differences among groups. The differences among items are averaged out. Again, to stress what we said earlier, whether this flavor of heat map is useful depends on the analytic interest.

Conclusion

Suitably recoding priority rankings summarized in mean Borda counts can be a first step to analyze such ranked data as may arise in needs assessments. The procedure described in this note, resulting in a colored table, is quick and within the reach of the more commonly known features of Excel.

At the same time, this purely descriptive approach remains analytically superficial. Better results might be obtaining from methods like polychoric principal components (Kolenikov and Angeles 2004), cluster analysis and multiple correspondence analysis of the resulting clusters versus population groups. However, the effort to run such analyses, test the findings appropriately and communicate them to colleagues and consumers of assessment reports may in most situations not be warranted.

A quick-and-dirty method, within Excel, appears largely preferable - as long as we remain mindful of what we want to do, and why.

One final caveat is in place:

The total number of assessed communities may be small. Special care then has to be taken to safeguard against unrecognized influences of small changes in individual preferences and their potentially considerable effects on the ranking of items or groups. This is a challenge that the quantitative treatment of data that fundamentally originated as qualitative information faces everywhere - also in the interpretation of heat maps used in needs assessments.

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