BBC MEDIA ACTION
TRANSFORMING LIVES THROUGH MEDIA AROUND THE WORLD

Technical appendix

Strengthening accountability through media in Myanmar: final evaluation

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Research and Learning

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Introduction

This technical appendix is intended to be read alongside the associated BBC Media Action report, *Strengthening accountability through media in Myanmar: final evaluation*. This is available from: [http://dataportal.bbcmediaaction.org/site/assets/uploads/2016/07/Myanmar-Country-Report-2017.pdf].

1. Survey sampling methodology

As outlined in the table below, BBC Media Action carried out three nationally representative surveys as part of the evaluation of the Global Grant Governance project in Myanmar.

Table 1: Quantitative surveys conducted (2013-2016)

Study	Data collection	Sample size	Criteria
Baseline	June-July 2013	n=1,224	Nationally representative, adults 15+ in 11 of Myanmar's 15 states, regions and union territories
Midline tracker*	June-July 2014	n=1,500	Nationally representative, adults 18+
Endline	May-July 2016	n=3,000	Nationally representative, adults 15+

* *Carried out via omnibus survey*

For each of these surveys, the sample was stratified across the major geographical divisions of the country (by region/district/ward/village tracts). Within these geographical divisions a probability proportional to size multistage cluster sample was employed. At all stages, the selection of clusters was random and self-weighting. The sampling frame for these surveys was constructed using the most recent census data. Within enumeration areas, predefined random starting points were used to begin household selection. Random walk was applied with a fixed household interval. Within households, a Kish grid was used to select respondents randomly.

Data collection was carried out using face-to-face interviews and recorded using paper and pen.

After data collection, the samples were compared to the most up-to-date population data and, where necessary, nested weights were applied to correct for any imbalances in region/state, gender, age and location (urban vs rural). In 2013, data based on population estimates from the Population Reference Bureau (PRB) were utilised. The 2014 Myanmar Population and Housing Census data was utilized in 2014 and 2016, where available.[1]

[1] Not all levels of demographic disaggregation were available within the 2014 Myanmar Population and Housing Census data. Therefore, the most up to date PRB data was used to estimate the age distribution of the population.

2. Regression analysis

This technical appendix summarises the results of analysis BBC Media Action carried out on the Myanmar endline dataset (2016), which was representative of Myanmar's national adult population (15+).

BBC Media Action carried out regression analysis to test the association between exposure to a series of programmes and several governance outcomes (political knowledge, discussion, participation and inclusive attitudes), while controlling for some of the other key factors which may influence these outcomes. The programmes included:

- *Lin Lait Kyair Sin* (LLKS) (Bright Young Stars) – produced by BBC Media Action
- Tea Cup Diaries – produced by BBC Media Action
- Lively News – produced by Myanmar Radio and Television (MRTV) with capacity-strengthening support from BBC Media Action
- Current Affairs – produced by MRTV with capacity-strengthening support from BBC Media Action

Variables

The independent variables for regression analysis were based on exposure to one or more of the governance programmes. Each independent variable had two categories: regularly exposed to the relevant programme (exposed to at least every other episode), and never exposed. Those who had been exposed, but not regularly, and those without access to media were set as 'missing'.

LLKS, Lively News and Current Affairs were all designed to impact audiences' political knowledge, discussion and participation. So, when testing the association between exposure to one or more of the programmes and these outcomes, BBC Media Action controlled for the impact of the other programmes:

- For exposure to Lively News and Current Affairs, anyone exposed to LLKS was set as missing and excluded from the analysis
- For exposure to LLKS, audiences of Lively News and Current Affairs were not excluded as this would have made the sample size too small to carry out the analysis. Instead, the variable exposure to Lively News and Current Affairs was added as a confounder in the regression model

Tea Cup Diaries, on the other hand, aimed to impact inclusive attitudes among its audiences. As this was not an intended outcome for the other programmes, exposure to those programmes was not controlled for.

The dependent variables were constructed as either categorical or continuous variables, dependent on the distribution of the outcome variables. Logistic regression was carried out for categorical dependent variables, and linear (OLS) regression was conducted for continuous dependent variables.

In addition to being based on past research and the specific country context, the confounders used in the analysis were chosen because they were hypothesised to be key factors in influencing the outcome variable. They therefore varied slightly across models.

Significance testing

Before carrying out regression analysis, BBC Media Action conducted statistical tests in order to measure the strength and the direction of bivariate relationships, as well as to test their significance. More precisely, BBC Media Action analysed:

- The relationship between the main independent variable (exposure) and the construct variables defined as outcomes (political knowledge, discussion, participation and inclusive attitudes)
- The relationships among outcome variables
- The relationship between exposure and all the socio-demographic variables potentially associated with it (referred to as "confounders")
- The relationship between the outcome variables and confounders

BBC Media Action conducted different types of significance tests according to the nature of the variables considered. T-tests and Mann-Whitney U-tests were used to compare the differences between means, Pearson's R and Spearman's Rho tests were used to ascertain correlation, and Chi-squared tests were conducted to measure associations. All significance tests were conducted with significance at the $p = 0.05$ level.

Analysis

As mentioned above, BBC Media Action carried out different types of regression analysis based on the dependent variable.

> **Logistic regression:** this allows researchers to work with categorical variables such as the binary variables where the distribution of the variables does not follow a normal and linear distribution that could have fitted better in another statistical model such as a linear regression. The logistic regression produces a probability value or odds ratio (OR) that indicates how much more (or less) likely it is that cases with specific attributes will fit into a model that explains the presence of certain outcomes. The regressions are calculated with a certain degree of confidence specified by the model. This confidence interval is used to understand if the changes in one variable are associated with changes in the other as a result of a statistical relationship that can be explained by the model. Here, any value above 95% is considered as statistically significant.
>
> **The ordinary least squares (OLS) model:** this allows researchers to work with a continuous dependent variable, derived through confirmatory factor analysis, and independent variables that have either continuous or categorical values. The regression coefficient for the independent variable provides key information indicating the estimated change in the dependent variable associated with a one unit increase in the independent variable. The model seeks to summarise this association by fitting a straight line to predict the value of the dependent variable based on the observed values of the independent variables.

BBC Media Action's data satisfied the principle assumptions required for justifying the use of OLS: the relationships between the dependent and independent variables were linear and additive, and the error terms were normally distributed, constant, and were not correlated. With these assumptions met, a confidence interval for the regression line was calculated for each estimate and BBC Media Action was able to test whether the hypothesis of a zero slope – that is of no relationship between the two key variables of interest – existed in the true population.

Prior to analysis, BBC Media Action adopted the conventional standard of rejecting the null hypothesis at the 0.05 level. Given this, BBC Media Action expects that any estimated effects that are significantly associated with exposure to the programme of interest fall within the range reported in the confidence intervals 95% of the time.

Table 2: Overview of regression models*

Model	Model performance			Association with exposure		
	Sample size	R square	Significance (OLS only)	Association (OR/ coefficient)	95% confidence interval/ standard error (SE)	Significance
Regression1: LLKS knowledge logistic model	2,926	0.336	-	2.016 (OR)	SE 0.189	<0.001
Regression 2: LLKS discussion logistic model	2,928	0.175		1.513 (OR)	SE 0.208	0.046
Regression 3: LLKS participation logistic model	2,928	0.225	-	1.572 (OR)	SE 0.204	0.027
Regression 4: Lively News/Current Affairs discussion logistic model	2,928	0.174	-	1.660 (OR)	SE 0.139	<0.001
Regression 5: Lively News/Current Affairs participation logistic model	2,928	0.223	-	1.463	SE 0.129	0..003
Regression 6: Tea Cup Diaries inclusive attitudes OLS model	2,525	0.086	<0.001	0.397	0.228-0.566 (SE 0.086)	<0.001

**Analysis was carried out on the Myanmar endline dataset (2016)*

Full model results

Note: 'Ref' indicates the reference category of each variable

LLKS

Table 3: Regression 1 – Knows a great deal or a fair amount about politics versus knows very little/nothing at all (LLKS knowledge logistic model)

Variable	Standard error	Significance level	Odds ratio
Not exposed to any of the three programmes	Ref	-	-
Regularly exposed to Lively News/Current Affairs	.125	.000	1.963
Regularly exposed to LLKS	.189	.000	2.016
Education – low	Ref	.002	-
Medium	.114	.223	1.150
High	.201	.000	2.025
Male	Ref	-	-
Female	.093	.000	.689
Income – very low	Ref	.358	-
Low	.132	.163	1.203
Medium to high	.148	.222	1.199
Age 15-24	Ref	.000	-
Age 25-34	.137	.884	.980
Age 35-44	.141	.007	1.464
Age 45+	.127	.000	1.633
Urban	Ref	-	-
Rural	.108	.531	1.070
Group membership – not a member	Ref	-	-
Member	.108	.010	1.320
Interest in politics – not at all/not very interested	Ref	-	-
Somewhat/very interested	.082	.000	4.381
Constant	.254	.000	.020

The Nagelkerke R statistic for this model was 0.336. The Hosmer and Lemeshow statistic had a chi-square of 27.656 and a significance level of 0.001.

Table 4: Regression 2 – Discusses politics versus never discusses politics (LLKS discussion logistic model)

Variable	Standard error	Significance level	Odds ratio
Not exposed to any of the three programmes	Ref	-	-
Regularly exposed to Lively	.140	.001	1.609

News/Current Affairs			
Regularly exposed to LLKS	.208	.046	1.513
Education – low	Ref	.000	-
Medium	.098	.007	1.304
High	.215	.000	2.714
Male	Ref	-	-
Female	.085	.001	.747
Income – very low	Ref	.008	-
Low	.112	.051	1.243
Medium to high	.127	.588	.933
Age 15-24	Ref	.335	-
Age 25-34	.121	.186	1.173
Age 35-44	.128	.091	1.242
Age 45+	.114	.446	1.091
Urban	Ref	-	-
Rural	.099	.846	.981
Ethnicity – non-Bamar	Ref	-	-
Bamar	.096	.000	.673
Interest in politics – not at all/not very interested	Ref	-	-
Somewhat/very interested	.087	.000	2.700
Group membership – not a member	Ref	-	-
Member	.116	.000	2.388
Constant	.180	.186	.788

The Nagelkerke R statistic for this model was 0.175. The Hosmer and Lemeshow statistic had a chi-square of 18.727 and a significance level of 0.016.

Table 5: Regression 3 – Participated at least once versus not participated (LLKS participation logistic model)

Variable	Standard error	Significance level	Odds ratio
Not exposed to any of the three programmes	Ref	-	-
Regularly exposed to Lively News/Current Affairs	.130	.007	1.417
Regularly exposed to LLKS	.204	.027	1.572
Education – low	Ref	.012	-
Medium	.100	.004	1.329
High	.191	.045	1.464
Male	Ref	-	-
Female	.084	.000	.507
Income – very low	Ref	.024	-
Low	.113	.996	.999
Medium to high	.129	.043	.770
Age 15-24	Ref	.000	-
Age 25-34	.119	.000	1.822

Age 35-44	.127	.000	2.488
Age 45+	.114	.000	2.578
Urban	Ref	-	-
Rural	.098	.000	2.001
Ethnicity – non-Bamar	Ref	-	-
Bamar	.094	.867	1.016
Interest in politics – not at all/not very interested	Ref	-	-
Somewhat/very interested	.088	.000	2.229
Group membership – not a member	Ref	-	-
Member	.113	.000	2.917
Constant	.183	.000	.251

The Nagelkerke R statistic for this model was .225. The Hosmer and Lemeshow statistic had a chi-square of 19.659 and a significance level of 0.012.

Lively News and Current Affairs

Table 6: Regression 4 – Discusses politics versus never discusses politics (Lively News/Current Affairs discussion logistic model)

Variable	Standard error	Significance level	Odds ratio
Not exposed to Lively News/Current Affairs	Ref	-	-
Regularly exposed to Lively News/Current Affairs	.139	.000	1.660
Education – low	Ref	.000	-
Medium	.098	.006	1.308
High	.215	.000	2.701
Male	Ref	-	-
Female	.085	.000	.741
Income – very low	Ref	.007	-
Low	.112	.047	1.248
Medium to high	.127	.593	.934
Age 15-24	Ref	.305	-
Age 25-34	.120	.170	1.180
Age 35-44	.128	.078	1.253
Age 45+	.114	.397	1.101
Urban	Ref	-	-
Rural	.099	.944	.993
Ethnicity – non-Bamar	Ref	-	-
Bamar	.096	.000	.671
Interest in politics – not at all/not very interested	Ref	-	-
Somewhat/very interested	.087	.000	2.722
Group membership – not a member	Ref	-	-
Member	.116	.000	2.400
Constant	.180	.183	.786

The Nagelkerke R statistic for this model was 0.174. The Hosmer and Lemeshow statistic had a chi-square of 16.020 and a significance level of 0.042.

Table 7: Regression 5 – Participated at least once versus not participated (Lively News/Current Affairs participation logistic model)

Variable	Standard error	Significance level	Odds ratio
Not exposed to Lively News/Current Affairs	Ref	-	-
Regularly exposed to Lively News/Current Affairs	.129	.003	1.463
Education – low	Ref	.011	-

Medium	.100	.004	1.335
High	.191	.048	1.458
Male	Ref	-	-
Female	.084	.000	.502
Income – very low	Ref	.023	-
Low	.113	.973	1.004
Medium to high	.129	.044	.771
Age 15-24	Ref	.000	-
Age 25-34	.119	.000	1.835
Age 35-44	.127	.000	2.512
Age 45+	.114	.000	2.604
Urban	Ref	-	-
Rural	.098	.000	2.029
Ethnicity – non-Bamar	Ref	-	-
Bamar	.094	.898	1.012
Interest in politics – not at all/not very interested	Ref	-	-
Somewhat/very interested	.088	.000	2.250
Group membership – not a member	Ref	-	-
Member	.113	.000	2.929
Constant	.183	.000	.250

The Nagelkerke R statistic for this model was 0.223. The Hosmer and Lemeshow statistic had a chi-square of 22.300 and a significance level of 0.004.

Tea Cup Diaries

Table 8: Regression 6 - Tea Cup Diaries inclusive attitudes OLS model
Dependent variable: inclusive attitudes (0 to10, with 10 being most inclusive)

Predictor	Unstandardized coefficients		Standardized coefficient	Significance	95.0% confidence interval for B	
	Beta	Standard error	Beta		Lower bound	Upper bound
Not exposed to Tea Cup Diaries	Ref	-	-	-	-	-
Regularly exposed to Tea Cup Diaries	.397	.086	.090	.000	.228	.566
Group membership – not a member	Ref	-	-	-	-	-
Member	.389	.070	.111	.000	.253	.525
Interest in politics – not at all/not very interested	Ref	-	-	-	-	-
Somewhat/very interested	.533	.062	.174	.000	.412	.654
Male	Ref	-	-	-	-	-
Female	-.117	.059	-.040	.048	-.234	-.001
Urban	Ref	-	-	-	-	-
Rural	-.135	.067	-.043	.045	-.266	-.003
Age 15-24	Ref	-	-	-	-	-
Age 25-34	.049	.102	.013	.634	-.152	.249
Age 35-44	.234	.101	.066	.020	.037	.432
Age 45+	.171	.092	.058	.062	-.009	.351
Education - low	Ref	-	-	-	-	-
Medium	.144	.066	.048	.031	.013	.274
High	.661	.128	.115	.000	.410	.913
Income - very low	Ref	-	-	-	-	-
Low	-.204	.079	-.069	.010	-.359	-.049
Medium to high	-.323	.089	-.103	.000	-.498	-.148
Ethnic group – non-Bamar	Ref	-	-	-	-	-
Bamar	-.288	.068	-.083	.000	-.421	-.155
Constant	7.349	.133		0.000	7.088	7.609

The model had an adjusted R square of 0.086. The Durbin-Watson value was 1.704. The F statistic was 19.297 (significance < 0.001).