

Empirical Analysis of Current Operations to Support Planning

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Abstract

UK Doctrine envisages operational planning based on the identification of observable effects, derived from the strategic aim, in both the physical and cognitive domains. Currently there is a lack of analysis on empirical data on the effects in the cognitive domain. This study aims to quantitatively investigate relationships between the UK/coalition activities in current operations and a number of different factors with respect to local perceptions and public support for the UK & coalition forces. Empirical data was collected on UK & coalition forces' activity levels, civilian casualty levels, local/international media output, levels of insurgent activity and local public opinion. A model was developed for predicting coalition support based on information obtained from surveys. These surveys asked the public on their general concerns and their opinions on forces in the area.

1. Introduction

UK Doctrine envisages operational planning based on the identification of observable effects, derived from the strategic aim, in both the physical and cognitive domains. The physical domain is reasonably well understood, however there is a lack of analysis on empirical data on the effects in the cognitive domain. This study aims to quantitatively investigate relationships between the UK/coalition activities in current operations and a number of different factors with respect to local perceptions and public support for the UK & coalition forces.

In order to carry out an empirical analysis, sources of useful data were identified including UK/coalition activity levels, civilian casualty levels, local/international media output, levels of insurgent activity and local public opinion.

Other sources of data that were used to carry out the analysis included public opinion polls conducted throughout 2003 until 2008, and additional polling information and public utilities data from US academia (Brookings Institute). Information on civilian casualties was obtained from the Iraq Family Health Survey, which details deaths from violent and non-violent means.

A statistical analysis was conducted to identify any quantifiable associations between people's perceptions and concerns over their utility supply, security in their area, etc, and support for the UK/coalition forces.

2. Public Opinion and Provision of Utilities

A reasonable correlation was found between the actual electricity supply (Brookings Institute information) and local people's opinions of their electricity supply. This may appear obvious but it might not have been the case; for example people could have said that the electricity was bad whether or not it had improved or their response could have been highly correlated with their opinion of coalition forces and therefore suggested greater dissatisfaction over time when electricity supply was in fact improving. This result is important because it suggests that we can use local opinion about provision of services as a proxy measure of the

actual delivery of services. For services, such as sewage or refuse disposal, for which it can be hard to obtain reliable data this could be useful.

People were also asked to rate a number of factors on how important they were to them. Over a seven month period delivery of services such as electricity and water, and disposal of sewage consistently came out as a higher priority than security (Table 1). Analysis of the Iraq Family Health Survey data showed that the majority of the excess civilian deaths since the invasion were due to non-violent causes, particularly disease (Figure 1). Since provision of services has a major impact upon the incidence of disease, it again appears people’s perception of the risks was in good agreement with the reality. The study then sought to determine whether this kind of information on people’s concerns could support planning in a bid to gain support for the coalition.

Date	1st priority	2nd priority	3rd priority	4th priority	5th priority
Jun-06	Improving Electricity Availability	Unemployment	Improving Sewage Disposal	Improving Water Distribution	Improving Refuse Collection
Jul-06	Improving Electricity Availability	Security	Improving Water Distribution	Managerial Corruption	Improving Sewage Disposal
Aug-06	Improving Electricity Availability	Unemployment	Fuel	Security	Improving Water Distribution
Sep-06	Improving Electricity Availability	Unemployment	Road Repair	Improving Sewage Disposal	Security
Oct-06	Improving Electricity Availability	Unemployment	Road Repair	Improving Sewage Disposal	Improving Water Distribution
Nov-06	Improving Electricity Availability	Road Repair	Improving Sewage Disposal	Unemployment	Improving Water Distribution
Dec-06	Improving Electricity Availability	Improving Sewage Disposal	Land Phone Services	Unemployment	Security

TABLE 1: Local Concerns Data

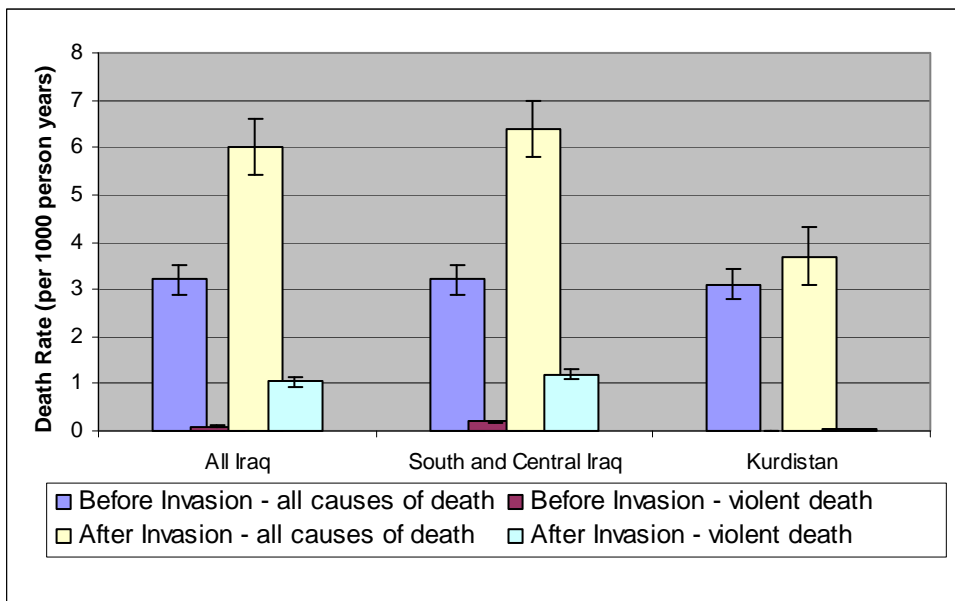


FIGURE 1 Civilian death rates from the Iraq Family Health Survey

A bi-clustering analysis was carried out, with the aim being to try and identify, using poll data, whether people who supported or were opposed to attacks on the coalition had similar concerns over utilities and services. To do this people were clustered according to their concerns and then tested to see whether people with similar opinions/concerns of their services had similar opinions of the coalition. As can be seen from figure 3, people who have similar concerns also often share the same opinion of attacks on the coalition.

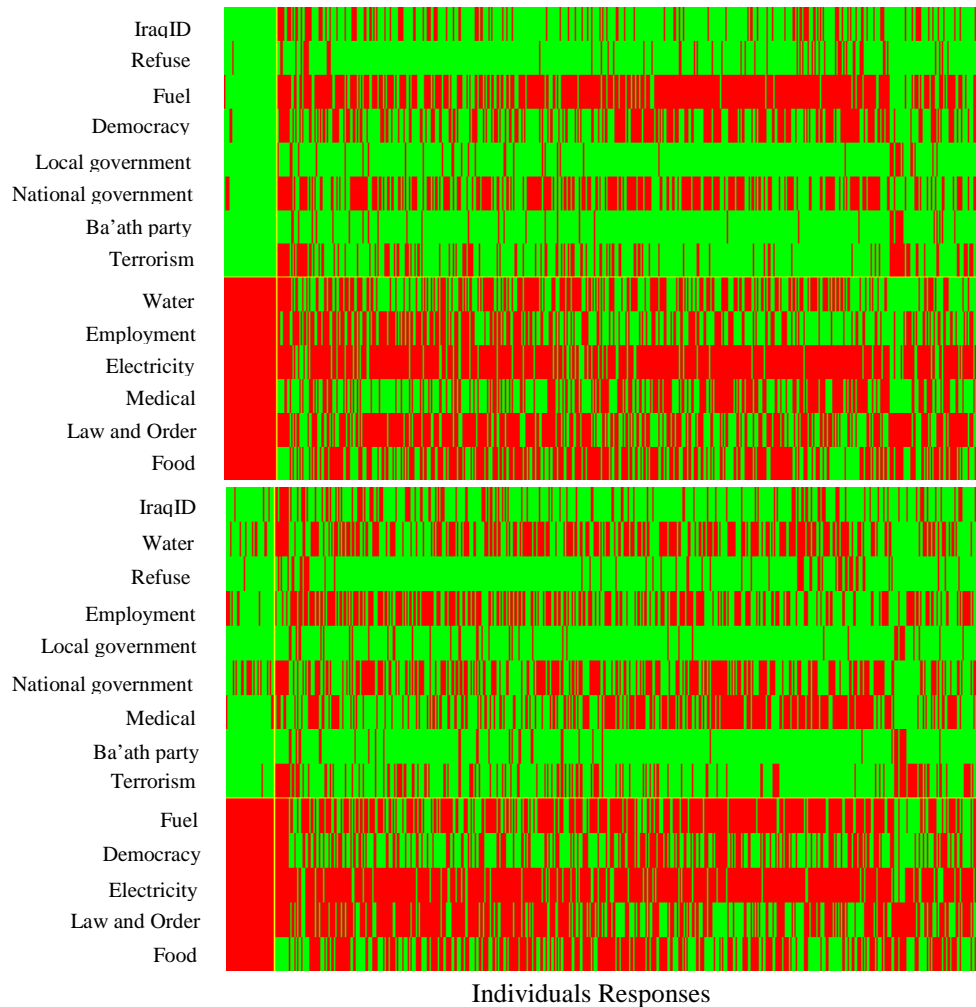


FIGURE 2 Example clusters of Iraqis grouped by their concerns. People polled are along the x-axis, the factors they are concerned about are in red (green indicates this person did not think of this factor as one of their primary concerns)

For example, 8% of the 108 individuals whose top concerns included water, employment and medical services supported attacks on the coalition (compared to 50% of the population as a whole). In contrast, 80% of those questioned whose priorities and concerns included fuel and democracy supported or strongly supported attacks on the coalition.

Concerns about law & order and the availability of electricity and food were characteristic of both people who supported the coalition and those who did not. Therefore, concern about these factors by themselves cannot act as strong predictors for coalition support. These results

highlight the fact that people who are against or support the coalition may share similar individual concerns. However when groups of concerns are analysed, people can be more clearly classified.

The next stage of the analysis was to develop and test the feasibility of a predictor model of support for the coalition from people's opinions and concerns. This should enable us to begin to understand the potential effects of improvements in, for example, electricity supplies upon support for multinational forces. The model was trained on poll data over a week in 2008 in which approximately 1000 individuals were asked to rate their concern regarding the factors below on an eleven point scale, as well as whether they thought attacks on coalition troops were justified.

The factors that people were asked to rate their concerns for included:

- Security and safety
- Availability of jobs
- Availability of electricity
- Traffic and congestion
- Availability and quality of health services
- Corruption in society
- Prices of goods and services
- Availability of basic goods/services
- The system of justice and fair trial
- Violence by government officials/ ISF
- Democracy with directly elected representatives
- Freedom to express personal opinions

Using just the individuals from the one poll that this model is based on, a ROC curve analysis (where the minimum area above the curve is desired) shows that the performance of the model at classifying those individuals according to their support for the coalition and the factors above is good (Figure 3). Looking at the values that were obtained, at a true positive rate (sensitivity) of 40%, i.e. the correct identification of 40% of all people who think attacks on coalition troops are justified, the false positive rate (1-specificity) is under 2%, i.e. less than 2% of all people who are against attacks on the coalition are misclassified by the model as in fact supporting attacks.

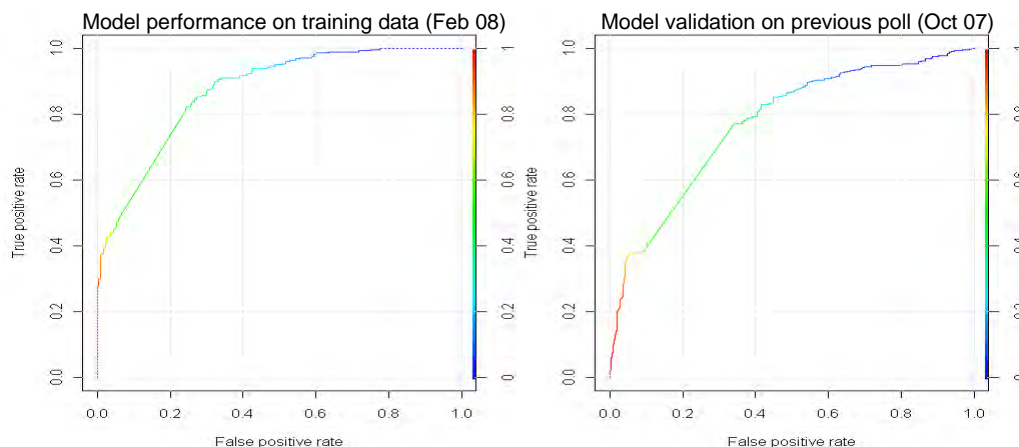


FIGURE 3: Performance of Basra model at predicting those people who support attacks on the coalition.

The model was then validated using a similar poll that was also asked to a different set of 1000 people in the same districts (Figure 3) approximately 3 months before. The model unsurprisingly performed less well, with a true positive rate of around 38% the false positive rate was still only around 5% however.

As this model was based on results obtained from just one area of the country, it was further tested to see if it represented the country as a whole. It was found that this model is specific to the area that it was based upon and the concerns of people in this area and their association with whether or not they support attacks on the coalition are not characteristic of the whole of the country (Figure 4). The false positive rate and true positive rate are approximately equal in this case; hence the model is an ineffective predictor nationally. This highlights that the links between priorities and support for attacks on the coalition differs between the various regions of Iraq.

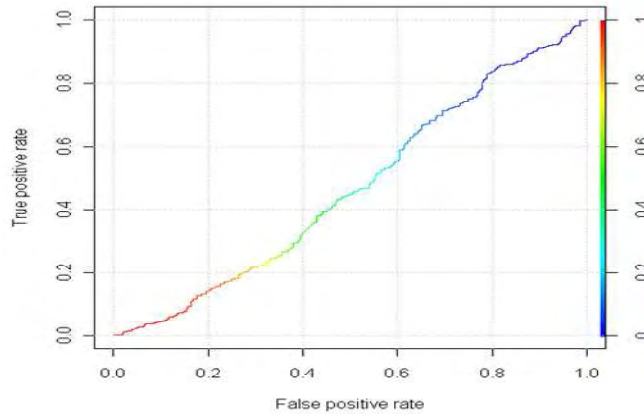


FIGURE 4: Performance of Basra model at predicting people from around Iraq’s support for the coalition

3. Factors Relating to Civilian Casualties

Using the US academic data on public opinion the association between casualty rates and public opinion where the public were asked “Do you think Iraq today is generally heading in the right direction or the wrong direction?” is relatively weak, with a regression coefficient (R^2) of 0.31, although significant at the 98% level. This is not least because there are at least 3 apparent outliers in the 16 data points (Figure 5).

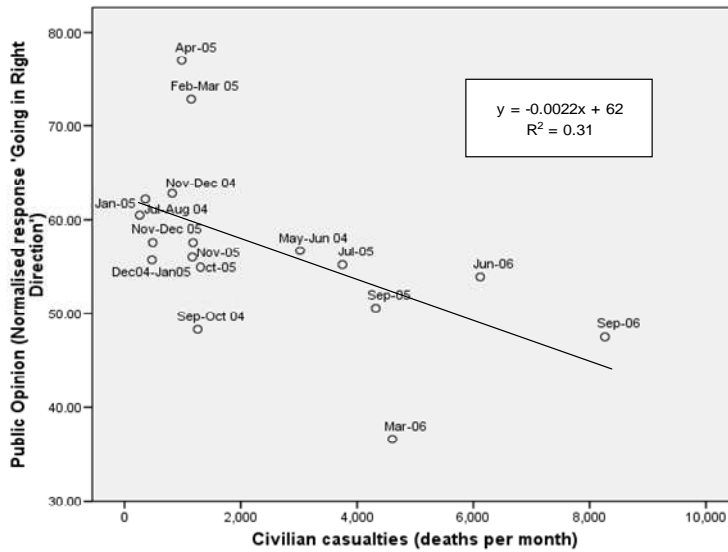


FIGURE 5: Polling response plotted against civilian casualty rate

The 2 high ‘outliers’ correspond to polls in the first quarter of 2005, whilst the low ‘outlier’ corresponds to March 2006. It is not enough to explain the increase in positive public opinion with the low casualty rates alone but more than likely it is mainly due to the period up to April 2005 corresponding to the first National elections; and the reflection of the local ‘feelgood’ factor. Civilian casualty rates in March 2006 had risen by 60% or so since a low in autumn 2005, but public opinion was even lower than would be expected from this. This can probably be attributed to the February 2006 bombing of the golden Mosque in Samarra, one of Shi’ite Islam’s holiest shrines. Such an outrage would naturally lead people to think that things were not “going in the right direction”.

There is a further possible outlier in September 2004; this corresponds to the failure of initial attempts to pacify the ‘uprising’ in Fallujah and could indicate public disquiet at the failure to deal with the situation. Interestingly, the rating for early December – after the US Marines had re-taken Fallujah in November 2004 – is relatively high, possibly indicating public acceptance that security was being upheld.

If the 3 principal outliers are removed the association becomes much stronger with a regression coefficient (R^2) of 0.45 and significance at the 98% level. The simple casualty model is robust enough under normal circumstances but major events can also drive public opinion strongly.

Further analysis was conducted on factors associated with civilian casualties. A strong relationship is observed (Figure 6a) between the number of incidents involving an Iraqi civilian fatality attributed to coalition action and the number of execution-style killings (not judicial executions). The reason for the correlation cannot be stated at this time, it could simply be the two factors are simply proxies for the general level of violence in Iraq, or something more complicated. Further investigation is required. Figure 6b is the same relationship but over a longer length of time.

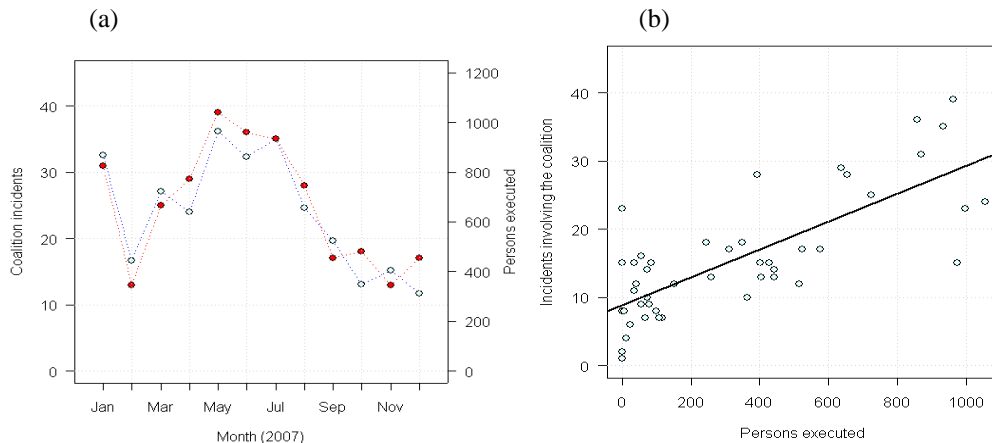


FIGURE 6 (a) The number of coalition incidents involving a civilian death (red) and the number of execution-style killings (blue) through 2007. (b) The number of coalition incidents involving a civilian death against the number of execution-style killings, by month, from March 2004 to December 2007.

It can also be observed that although a sizeable proportion of Iraqis support attacks on the coalition forces, in 2007, the last complete year where data was available, there was a consistent relationship between the number of coalition casualties and the number of incidents where civilians are killed during contact between coalition/security forces/Iraqi police etc and insurgents (Figure 7). For approximately every two coalition casualties there was one incident involving the death of one or more Iraqi civilians. A similar relationship was not however

observed in previous years and this may therefore be a spurious result or alternatively reflect a changing nature in the attacks on coalition forces.

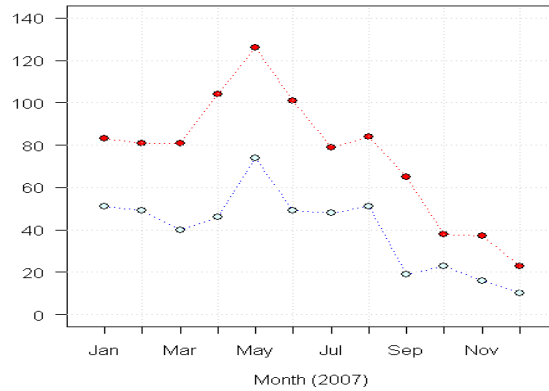


FIGURE 7: Number of incidents where one or more civilians were killed during contact between coalition, security forces or Iraqi police etc. and insurgents (blue) and the number of coalition casualties (red) by month during 2007

3. Conclusions

Local people's perception of the availability of services is correlated with the actual supply and thus polling data on the supply of services can be used as a reasonable proxy when data on the actual supply of services is difficult or impossible to obtain.

People who support attacks on the coalition can be distinguished from those who don't by their concerns.

A model has been developed that highlights the strength and direction of associations between people from Basra's concerns and their support for attacks on the coalition. This highlights the feasibility of producing predictive tools for determining an individual's probability of supporting attacks on the coalition that may eventually allow for the identification of the priorities for reconstruction efforts.

It has been highlighted however that the association between people's concerns and their support for the coalition is location dependent i.e. the concerns of people who support attacks on the coalition differs between regions.

Despite the fact that in 2007 there was a consistent approximately two-to-one relationship between the number of coalition casualties and the number of incidents where one or more civilians were killed during contact between coalition, security forces or Iraqi police and insurgents, a sizeable proportion of Iraqis still support attacks on the coalition forces, Highlighting such side-effects of attacks on the coalition may help to decrease the support among Iraqis for such insurgent actions.

There is also a very strong relationship between the number of incidents involving an Iraqi fatality attributed to coalition action and the number of execution-style killings of Iraqi civilians. This may be due to the overall level of violence but further research is needed.

The results shown here do not provide definitive answers as to whether changes in actions by the coalition or increased input in the provision or improvement of services will increase support received from the public but it has given a number of ways forward for this work. Further analysis of people's concerns and attitudes over time may provide some insights into whether there have been positive changes in attitude if improvements in services have occurred. Two major concerns that were associated with people who supported or strongly

supported attacks on the coalition were democracy and the availability of fuel. Could assisting in the improvement in either of these increase support?

It should be noted that the model developed could not act as a predictor for the country as a whole but was location dependent. Therefore a robust model needs to be populated with data from the area concerned.