Metrics for Counter-Insurgency Campaigns and Their Application to Efforts in Iraq

By Adam Smith

Events in Iraq over the past year have been diverse in nature, suggesting at times everything from a repeat of Afghanistan to a repeat of Lebanon. A central question surrounding the current efforts is: how well is the coalition doing? This paper attempts to answer that question. The goal is to find metrics and measurements which lead to an estimate of how well a counter-insurgency effort is doing. Although we are not interested in political or more broad "nation building" questions, it is hard to divorce these from the question of military counter-insurgency. Various political efforts can significantly affect any counter-insurgency campaign, as observed in many campaigns.[1]

To more narrowly define the topic, this paper is limited to discussion concerning one military objective: putting down the insurgency currently being conducted in Iraq. We do not discuss the military goal of establishing some form of Iraqi self-sufficiency by training police and army forces.

The beginning of this paper will outline paradigms and methods of measurement that will be useful. Next, specific metrics and heuristics for evaluating a counter-insurgency campaign will be presented. Finally, these metrics will be applied to the current situation in Iraq.

Principles of Metrics

There are four desirable properties in any metric. First, it should be representative; that is, it should reflect something that we are interested in. For example, the amount of textiles being produced in Iraq would not very well reflect the success of counter-insurgency efforts.

Second, it should be revealing. That is, ideally, evaluating the metric would provide the observer with some policy implications. For example, if the CPA in Iraq knew how well it was doing, on a scale from one to ten, this would not be revealing. So many factors would be put into that number that it would be impossible to pin-point the weak spots. A more typical example is polling; although approval ratings are useful in some ways, it can be hard to distinguish which manipulations of the situation would help.

Third, the metric should measure something that is unambiguous; that when indicators are present, the metric should imply a single interpretation. For example, if troops stumble upon a weapons stockpile, an observer does not know if the local inhabitants knew of it (suggesting bad cooperation or HUMINT) or not.

Fourth, a metric ideally measures something that is always observable. In the absence of an indicator, an observable metric still posits a conclusion. The weapons stockpile metric is not always observable, since in the absence of finding a stockpile the

[1] For example, in the rivalry between Greek and Turkish Cypriots in Cyprus in the winter of 1963-64, political forces trumped Greek military superiority and drove the Greeks to accept third-party peacekeeping forces in Cyprus.

observer cannot be sure if it does not exist or if it just has not been found. If a metric is both unambiguous and always observable, it will imply a single result all of the time.

Of course, no metric perfectly satisfies all of these properties, but when a large set of metrics are used in conjunction, a fairly accurate picture can be constructed.

There is an implicit assumption in our discussion so far that we can measure everything of interest. Unfortunately, many things of interest are intangible. The only way to circumvent this restriction is to use tangible things that should reflect the intangible thing of interest. For example, it would be nice to know how many active insurgents there are in a theatre, but this is a fantastically hard thing to measure. However, we can devise measurements like the number of attacks being brought against the counter-insurgency forces to get an idea of how many insurgents there are.

When measuring the success of a counter-insurgency campaign, at first glance it seems that only so-called *outputs* are important, things that test results. There are, however, *input* metrics which can be useful. This terminology is prescribed by viewing the theatre as a system, with inputs to some complicated thing, which then produces a set of outputs, as illustrated in Figure 1. To illustrate this, consider public approval of the coalition in Iraq. One way to measure this is through polling the public for their opinions (an output). However, if we know that the coalition is instigating massive civil action programs, then with some intuition we can predict that this will increase public opinion of the coalition. Such input metrics are most useful when the intuition needed to translate them to outputs is strong, and when there are not many good output metrics which directly measure the same phenomena predicted by the inputs.

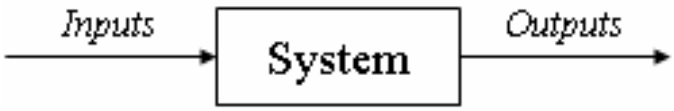

Figure 1. System relationship between measurable inputs and outputs.

Metrics in Counter-Insurgency Campaigns

Table 1 relates various metrics that we can use to evaluate higher-level quantities that we cannot easily measure. Even if we could measure the higher level quantities, using more metrics is a good thing if the relationship between the measurements used and the reliability of each is understood. For example, when getting an understanding for the amount of HUMINT the counter-insurgency has, even if raw statistics about the number of reports coming in from the streets is available, it might make sense to take into consideration more empirical information such as the number of weapons stockpiles which are being discovered.

In the table, a parent-child relationship, in which the child is an output metric, implies causation. For example, law and order causes low crime rates. If the child is an input metric, it is implied that it causes its parent. For example, high police to population ratios should imply that there will be law and order.

Sibling relationships imply correlation; that is, any metric should reveal the same trends as other metrics which share its parent.

All of these relationships are, once again, ideal. In fact, each metric is only useful under certain circumstances, and even then the reliability of the measurement might be questionable. In practice, it is important to keep these considerations in mind.

We will now discuss each metric. Where useful, discussion of each metric will be separated into a titled section.

Public opinion

The first concern when measuring public opinion with respect to counter-insurgency is its relevance. Counter-insurgency involves closely related military and political factors; while public opinion weighs more on the political success of the campaign, it does have large implications for military success. Insurgents, especially in an urban environment, rely on hiding within their surroundings. Thus, the old analogy of the fish in the sea comes into play - if the fish is in friendly waters, it will be impossible to find and defeat. This is the view of "hearts and minds" advocates: that "When a country is being subverted it is not being outfought; it is being out-administered."[2]

Opponents of this public opinion centered doctrine advocate so-called "cost-benefit counter-insurgency," in which public opinion is discounted to the point that it does not matter. Instead, the focus is on simply killing the insurgents.[3] Although a generalized discussion of these two schools is beyond the scope of this paper,[4] within the scope of the campaign in Iraq it is almost obvious that a hearts and minds campaign is the best doctrine to adopt, for several reasons. First, one of the largest arguments against it does not apply in Iraq; since the US-led CPA has nearly absolute authority in the counter-insurgency it does not have the leverage problem. That is, it does not have to worry about convincing a native government to focus on administration and public approval, a task that most third world countries are less focused on when faced with an insurgency. It is also important to note that since a new government is being constructed, the political goals posit a high priority to gaining the approval of the public's hearts and minds.

With the relevance of public opinion in mind, it is important to note that public opinion is an input measure. Therefore, when compared to its siblings which are outputs (e.g. the number of insurgents in the theatre), there is likely to be a lag in the correlation. The size of this lag is probably not a possible thing to measure, but it is something to keep in mind.

Polling

Polling is an extensive subject to study, and requires large amounts of attention to detail. When done correctly, however, it can be a very good metric for public opinion.

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[2] Bernard B. Fall, "The Theory and Practice of Insurgency and Counterinsurgency,"
[3] Leites and Wolf, *Myths and Realities,* p. 9-11
[4] For a more detailed comparison, see D. Michael Shafer, *Deadly Paradigms, The Failure of U.S. Counterinsurgency Policy*, p. 115-132

Thing Being Measured	Tangible?	Weakly Cause Revealing?	Measured as Input or Output?	Weakly Unambiguous?	Always Observable?
Security	No	Yes	Both	Yes	Yes
+**Public opinion**	No	No	Both	Yes	Yes
+Polling	Yes	No	Output	No	Yes
+Incoming HUMINT	Yes	No	Output	No	Yes
+Rate of offensive counter-insurgency operations	Yes	No	Output	No	No
+Rate of capture of wanted persons (e.g. Saddam)	Yes	No	Output	No	No
+Rate of capture of weapons stockpiles	Yes	Yes	Output	Yes	No
+Civil action / infrastructure	No	Yes	Input	Yes	Yes
+Money being spent	Yes	Yes	Input	Yes	Yes
+Electricity / school / hospital availability	Yes	Yes	Output	Yes	Yes
+Law & Order	No	No	Both	Yes	No
+Crime rates	Yes	No	Output	Yes	No
+Police to population ratio	Yes	Yes	Input	Yes	Yes
+**Number of insurgents**	No	No	Output	No	No
+Rate of attacks	Yes	No	Output	Yes	No
+Counter-Insurgent Death Rates	Yes	No	Output	No	Yes
+Foreign fighter immigration	No	Yes	Output	No	No
+Border patrol run-ins with foreign immigrants	Yes	Yes	Output	No	No
+**Skill of Insurgents**	No	No	Output	Yes	No
+Coordination level of attacks	Yes	Yes	Output	Yes	No
+Are they attacking hard but lucrative targets?	Yes	Yes	Output	Yes	Yes
+Types of weapons being used	Yes	Yes	Output	Yes	Yes
+Are the attackers surviving?	Yes	No	Output	No	No
+**Number of counter-insurgency forces**	Yes	Yes	Input	Yes	Yes
+**Skill of counter-insurgency forces**	No	No	Output	No	No
+Number of foiled attacks	Yes	No	Output	No	No
+Speed and effectiveness of responses to uprisings	Yes	Yes	Output	No	No

Table 1. Summary table of representative metrics for military success (i.e. localized security) in a counter-insurgency campaign.

There are three main weak points in polling with respect to counter-insurgency. First, unless they are designed in specific ways, polls are not revealing. If a poll is taken which asks the population about its approval of the CPA, it is hard to get a feel for what factors influenced the results. For example, if the polls say that the public thinks that the CPA is not doing a good job, it is hard to tell if people are upset about prisoner abuse that they hear about or the curfew that is being imposed.

The second weak point is that there can be biases in the result. Fortunately, this is a wide-spread problem and thus has been addressed by creating polling guidelines which delineate how polls should be conducted. The net result for an observer is that one just has to select which polls they use based on who performed them.

Finally, nation-wide and comprehensive polls can be expensive to perform, and thus do not provide a continuous set of data. For example, ABC conducted polling in Iraq during November of 2003 and then again in February of 2004.

HUMINT

Human intelligence is an important thing to have in any counter-insurgency campaign. It is required to be able to find the insurgents and their weapons.

The US Army attempts to betters its HUMINT by requiring its "Small unit leaders...to develop interpersonal skills - such as cultural awareness, negotiating techniques, and critical language phrases - while maintaining warfighting skills."[5]

As previously mentioned, human intelligence can be estimated by the counter-insurgents by measuring how often it gets information from natives. Nevertheless, there are other ways to measure this information, either for redundancy (in the case of the counter-insurgent) or as a supplement (in the case of an outside observer who does not have direct HUMINT measures).

Rate of offensive operations

The implicit assumption in measuring offensive operations is that HUMINT does indeed cause offensive operations. While this does make intuitive sense, the conditions under which this metric is meaningful should be enumerated.

This metric is ambiguous; in the presence of offensive operations there could be other causes for it other than HUMINT. These could include tracking of the enemy to a base of operations, randomly finding an enemy hide-out, or retaliating against a position previously used for insurgent offensive operations.

A possible enhancement to this metric, in the presence of the appropriate information, would be the rate of successful versus unsuccessful offensive operations. Successful here means that it went as anticipated; for example, it did not result in an ambush, a non-existent "weapons stockpile," et cetera. Testing for failed offensive operations (and thus bad HUMINT) is an un-observable test; if we find them then we have bad HUMINT, but in their absence we can't make any conclusions.

Capture of wanted persons

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[5] US Army Field Manual 3-0, June 2001, p. 9-5

This metric, although easy to measure and significant for political goals, is very ambiguous. If a fugitive is caught, it could mean that HUMINT is good, but it could also mean that the counter-insurgency forces are skilled, that they have good coverage, or that a large monetary reward was being offered.

While these ambiguities exist, it should be possible to distinguish the causes on a case-by-case basis, given enough research.

Capture of weapons stockpiles

This is a very good metric if the observer is a counter-insurgent. In this case, finding weapon stockpiles is easy to define to soldiers who should report the events. It is a fairly unambiguous metric, since finding stockpiles says something significantly good about the counter-insurgency's HUMINT capabilities. It is close to being completely observable; if it is not happening, the only possible explanations are that counter-insurgency forces do not have good HUMINT, that the stockpiles do not exist, or that the natives do not know where they are. Thus, if significant numbers of stockpiles have not been found yet, they probably exist and HUMINT is bad. Alternatively, if significant numbers of stockpiles are not being found, but were previously, the likely explanation is that all of them have been found.

Civil Action / Infrastructure

We define civil action as non-military aid efforts. These typically include two flavors of initiatives: infrastructure and good-will, where good will contains initiatives like food programs and dental hygiene classes.

As an input metric, the highest point of tension in including it for evaluating security is its causal link to public opinion. Moreover, is that link strong enough to justify allowing it to propagate through public opinion to security? That is, if civil action weakly improves public opinion, and public opinion weakly improves security, then civil action has a very small affect on security. The reliability of the causal links is something to keep in mind. Although civil action might not be relevant to situations which demand more of a cost-benefit approach, civil action is important in any hearts and minds campaign (as in Iraq).

Table 1 outlines two ways to measure civil action. While both are good metrics, their increased strength when combined is in their input and output natures; they complement one another. These also serve as a good illustration of input lag, since increased spending will result in more infrastructure some time later.[6]

While many infrastructure efforts are a positive factor in public opinion, lack thereof can be a negative factor, depending on what the native population expects. For example, in Baghdad, Iraq during early occupation the city's main power was shut off for a brief period of time for repairs. This was not communicated to the Iraqis, however, and the first impression of the CPA in Baghdad hurt because of it.[7]

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[6] Assuming that a significant portion of the increase is allocated to infrastructure projects, as opposed to good-will projects.

[7] I gleaned this story from my discussions with Stephen Van Evera, from whom I learned a lot about counter-insurgency.

The amount of money being spent is the catch-all metric for civil action. It is easily measurable, unambiguous, and always observable, all very good properties. It could also include the number of soldiers or civilians being tasked with civil action.

Law & Order

Aside from building infrastructure, the public also expects the government to maintain peace and lawfulness in the country. Fortunately, as in civil action, we have a way to measure law and order based on both input and output metrics.

The crime rates include things like robbery, murder, drug trafficking, etc. Ideally the data available to the observer will break down each type of crime so that more information is available, making the metric more cause revealing.

The police to population ratio is fairly straightforward in terms of its relationship to law and order. Its relationship to military force sizes, however, is not straightforward. Since counter-insurgency forces often work very close with the traditional police, it can be unclear who should be counted as "police." For the purposes of law and order calculations, "police" should be any force that is tasked with fighting crime (as opposed to insurgency) as defined in our discussion of crime rates.

Number of Insurgents

This metric is perhaps the closest to home out of any. Since the military goal being measured is counter-insurgency, the number of insurgents is probably the best first-order way to measure progress. Donald Rumsfeld, Secretary for Defense in the US, puts this question to his aides: "Are we capturing, killing or deterring and dissuading more terrorists every day than the madrassas and the radical clerics are recruiting, training and deploying against us?"[8]

If there was an easy and reliable way to measure the number of active insurgents in a campaign, much of the work of evaluating that campaign would be done. The only question then would be: what can be done to decrease that number? Unfortunately, however, there is no way to measure this directly. Only "guesstimates"[9] can be formed from the measurable quantities described below.

Rate of Attacks

If we know the rate at which attacks are occurring in a region, and make some assumptions about rate of involvement in attacks, we should be able to guess how many insurgents there are. For example, under the assumption that all active insurgents will participate between all and none of the attacks in a region (uniform probability

[8] Leaked memo to General Dick Myers, Paul Wolfowitz, General Pete Pace, and Dough Feith, dated October 16, 2003

[9] Since "estimates" might be too strong of a word, this term was coined in Anthony H. Cordesman, CSIS, "Iraq and Asymmetric Warfare: The US vs. FRL/Islamist Dual." I do believe, however, that more accurate numbers than Cordesman suggests can be obtained by careful application of the metrics discussed in this paper.

distribution), and we know approximately how many people were involved in each attack, we can calculate an estimate at the number of insurgents in that region.

This process makes many assumptions however, some of which the results are sensitive to. Suppose that, in fact, most of the insurgents were involved in most of the attacks; then the number of insurgents would be over-estimated. The inverse is also true. That is, as the involvement of insurgents in each attack increases, the correlation between attacks and insurgents becomes greater.

Whatever the distribution of insurgent involvement, the insurgents who are more active in attacks are probably most likely to be killed. Now consider two more assumptions. First, that any individual insurgent will never change their attack involvement relative to the number of attacks occurring. Second, assume that the rate of new insurgents coming into the theatre is small relative to the number of current insurgents. Then, with time the average individual involvement of the insurgency decreases, which leads to a lower correlation between rate of attacks and number of insurgents. This will then bring the rate of attack metric (if not adjusted for this effect) to under-estimate the number of insurgents.

It could be argued, however, that the number of insurgents is irrelevant; that we are only interested in the rate of attacks when evaluating security. This seems like a logical assertion when the rate of attacks is high (large correlation), but when the rate of attacks is low it depends on the amount of acceptable violence. Furthermore, if the rate of attacks is low but the intensity is high, security could still be threatened. Thus, the inter-play between both the number of insurgents and the intensity of attacks is important.[10]

Counter-Insurgent Death Rates

Let us assume that counter-insurgent death rates reflect the insurgency's effectiveness, and that the insurgency's effectiveness is directly related to the number of insurgents and their skill. Then, if the death rates and the effectiveness of the insurgents are known, we can get an idea of the number of insurgents. Alternatively, if the number of insurgents is known, then the effectiveness of the insurgents can be found.[11] This metric is classified as a function of the number of insurgents because the number of insurgents is more likely to change than their ability is, making differential analysis meaningful to measure the increase or decline in the number of insurgents.

Foreign Fighter Immigration

Although the recruitment of new local insurgents is difficult to measure, another form of recruitment (bringing in foreigners) is more easily observed.

By making the assumption that border patrols can observe or intercept some fraction of foreign fighters trying to enter the country, and by making a guess at that assumption, the rate at which foreign fighters are immigrating can be estimated. By

[10] This will be discussed later, under "Ability of Insurgents"

[11] This can be thought of as an under-determined mathematical equation, in which there are three variables, one of which (the counter-insurgent death rate) is known. We can solve for either of the remaining two in terms of the other.

integrating that rate over time, an estimate of the total number of foreign fighters can be derived.

This chain of logic involves several assumptions, most of which are weak. This metric is probably only tale-telling when the numbers involved are significantly high, so that even in the presence of errors the results are conclusive.

Skill of Insurgents

In the extreme case, a handful of insurgents can devastate security in a region if they are properly skilled and equipped. Inversely, if the insurgents are engaging in an urban theatre as a decentralized, unskilled mass, they will be much easier to find and defeat.

The coordination level of attacks is a fairly tangible metric which reveals how skilled the insurgents are in planning. Are the attacks prepared, or do they seem to be carefully orchestrated? Do multiple attacks occur in the same region at the same time, implying higher level coordination? The only undesirable property of this metric is that it is not always observable. In the absence of coordination indicators, we cannot assume that they are not well coordinated.

By definition the insurgents have incentives to attack the hard but lucrative targets, but whether or not they attack them is a function of how they perceive their own ability. If the insurgents are confident enough to attack police stations, and especially if they succeed, we can likely conclude that they have a good deal of skill.

Number of Counter-Insurgency Forces

The number of counter-insurgency forces is an easy thing to measure, and manipulate, from the perspective of the counter-insurgents. While it contributes to the amount of security in the theatre, it can be misleading. If so many troops are brought in such that the counter-insurgency to population ratio is one, this will artificially inflate security, but will not provide long term security after the forces leave.

Also, as Grivas points out,[12] having too many counter-insurgents can hurt their efforts by providing the insurgents with more targets.

The number of forces should be measured relative to the population in which they are deployed.[13] This follows logically from the idea that to win an insurgency the government must be able to out-administer the insurgents.

There are two questions that can now be asked. The first is: is a given force size the right number? If all other "inputs" are taken to be constant, one could try that force size to test if it is appropriate. If it is not, the force size should then be increased or decreased based on an understanding of the situation (i.e. hopefully the metrics which suggest that security is bad are revealing, so that they give policy implications).

Ideally, though, such a trial and error process would be minimized by making a good first guess at the requirements. It is less clear how this can be accomplished; the

[12] George Grivas, *Guerilla Warfare* p. 46

[13] A more comprehensive treatment of this idea is given in James T. Quinlivan, "Force Requirements in Stability Operations."

best option is to make guesses at what the situation will look like and then make a force size decision based on that relative to some past lessons from history.

The effectiveness of a given force size, though, is largely a function of how skilled that force is.

Skill of Counter-Insurgency Forces

When evaluating the skill of counter-insurgency forces, it is important to use output metrics whenever possible, since input metrics based on traditional warfare intuitions are likely to be incorrect. For example, even if the forces have precision aerial munitions, these bombs are not likely to be useful in urban counter-insurgency.

The speed and effectiveness with which counter-insurgency forces respond to emergencies requiring an immediate response is an important measure of their preparedness and agility. Examples of this include evaluating the response to a dense pocket of insurgent activity which the counter-insurgency forces previously stationed there cannot handle without reinforcements.

Application of Metrics to Iraq

The remainder of this paper will discuss the application of the metrics developed so far to the current situation in Iraq, as of around April 2004.

Public Opinion

Generally speaking, public opinion about the future of Iraq is high and likely to still increase. There should be elasticity between this and opinion about the CPA, but the correlation seems to be dampened. Nevertheless, even if polls show that public opinion of the coalition is relatively low, Iraqi confidence in their future should result in increasing security.

There is also a distinct difference in the public opinion of the CPA between northern Iraq and more Sunni-dominated areas that has important implications for troop deployment and general counter-insurgency operations.

Polling

The most authoritative poll done in Iraq that is publicly available is arguably the ABC News poll done most recently done in February 2004.[14] The comprehensiveness of this poll in its questions becomes an issue when selecting which responses to pay attention to.

When asked "How long should coalition forces remain," the majority of Iraqis (36%) responded "Until Iraq gov't is in place," as opposed to 15% who said "Leave now." Also, "The poll finds that 78 percent of Iraqis reject violence against coalition forces, although 17 percent – a sixth of the population – call such attacks 'acceptable.'

[14] For details of the operation of this poll, or for more detailed results, see http://abcnews.go.com/sections/us/PollVault/PollVault.html

One percent, for comparison, call it acceptable to attack members of the new Iraqi police." Support for the coalition is, though, significantly strong in northern Iraq.

Generally speaking, the poll reveals that most Iraqis think somewhat optimistically about the future of Iraq, but that some do not like coalition forces. It is difficult to put this into perspective; similar surveys have typically not been done during counter-insurgency operations in the past. Trends in the most recent February polling look good relative to a smaller poll done in November 2003, however. ABC News writes, "In terms of confidence in institutions, the gainers, as noted, are the Iraqi police – 68 percent express trust in it, up from 45 percent in November – and the Iraqi army, with 56 percent trust, up from 39 percent in the fall."

Once again, it would be nice if we had more data sets taken at different points in time, as opposed to this single sampling in February and a very small amount of data from November. While this would be nice, on the whole we can conclude that public support of the coalition is, at worst, acceptable. Cordesman, in analysis of the same poll, points out that "Minorities generally shape violence and civil war, not majorities." While the poll cannot provide a good picture into the thoughts and beliefs of the insurgents,[15] the conclusion we can come to is that their environment (the Iraqis around them) is not entirely friendly to them.

Incoming HUMINT

Before evaluating the events which should be symptoms of HUMINT, there is a small amount of public information about the information the coalition is receiving. In northern Iraq, "Iraqi citizens increasingly are providing information that leads coalition forces to insurgency organizers, bomb makers and financiers."[16] It is not clear that similar success is being experienced in other parts of Iraq, however. Indeed, as observed in the ABC poll data, the Kurds in northern Iraq are more amiable to coalition forces; this explains the good HUMINT there.

Unfortunately, data detailing daily operations in Iraq is not consistently available. Also, many of the offensive operations being launched are spawned by information gleaned from detainees captured in previous offensive operations. Thus, the coalition tries to either snowball the rate of intelligence or at least keep it constant, all independently of HUMINT gained from the public. General Kimmitt describes this, "The coalition remains offensively oriented in order to proactively attack, kill or capture anti-coalition elements and enemies of the Iraqi people, [to] obtain intelligence for future operations, and to [assure] the people of Iraq of our determination to establish a safe and secure environment."[17]

To illustrate a typical 24 hours in Iraq, "the coalition conducted 1,482 patrols, 31 offensive operations and 11 raids. They captured 78 anti-coalition suspects and released three detainees." The trend of offensive operations nationwide in Iraq across several months is shown in Figure 2.

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[15] Consider, for example, that 1% of respondents said that attacking Iraqi police was acceptable, and that about 20% of recent attacks have been targeted toward the police.

[16] American Forces Press Service, "Insurgent Success Rate Down in Northern Iraq Attacks Against Coalition," December 6, 2003

[17] Baghdad news conference, February 17, 2004

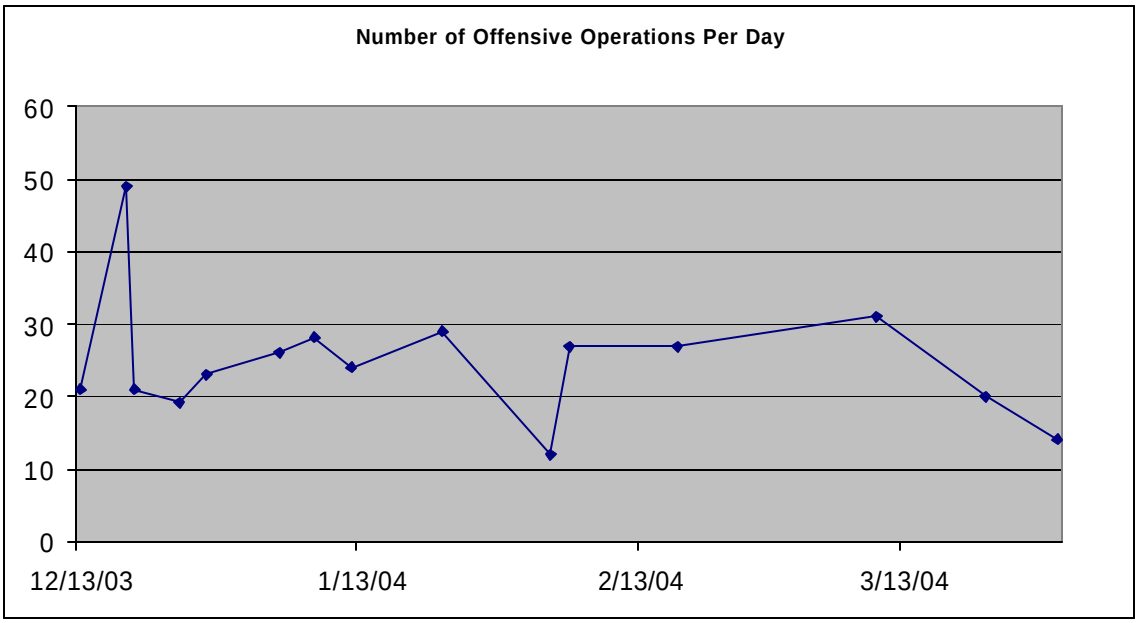

Figure 2. Offensive operations per day, December 13th, 2003 – March 30th, 2004[18]

The question now becomes one of interpreting these offensive operation numbers to reflect HUMINT capabilities and public opinion. As we will see, since estimates of the size of the insurgency range in the thousands, these numbers are not very significant. This is especially the case when one considers that many of these offensive operations were made possible by intelligence gained from detainees rather than native Iraqis. Perhaps this is why the CPA was able to halt offensive operations in Fallujah;[19] that is, since they were not being very effective, they were used as a bargaining chip instead.

The coalition has been extremely successful in capturing or killing fugitives on its wanted list.[20] Most of these occurred very early in the campaign, though, around May or June of 2003. In a news conference during July 2003, Major General Odierno observed "The most valuable intelligence that's here is HUMINT. So, we are very much involved in developing HUMINT information to track down HVT [High Value Target] Number One, as we call him, and any other HVT."[21]

The coalition has raised the rewards for information leading to the capture of those remaining on the list, offering $1 million for top-tier targets.[22] This monetary reward makes their capture a bad measure of HUMINT, although this increase might suggest that the coalition does not have the HUMINT resources to find these fugitives without offering the reward. The likely cause is that HUMINT was valuable for finding

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[18] Source: Department of Defense Daily Briefings. Note that data points were not available for every day.
[19] Department of Defense news article, "Cease-Fire Agreement Reached In Fallujah; 13 U.S. troops Killed In Iraq," April 19, 2004.
[20] See the complete "most wanted" list and current status at http://www.cjtf7.army.mil/irag-faqs/most-wanted.htm
[21] Major General Ray Odierno, U.S. Army's 4th Infantry Division, Videoconference, July 25, 2003.
[22] American Forces Press Service, "Coalition Enhances Reward Program in Hunt for Enemies," February 17, 2004.

the more visible targets that are now captured or killed, but that the remaining targets are the less visible ones and HUMINT has become less of an asset.

The capture of weapons stockpiles is probably the best hope for measuring HUMINT capabilities, since Iraqis will be most likely to know about them and they are easier to report in terms of location than are insurgents themselves. A troop in the 96th Civil Affairs Battalion, which conducts civil action operations, said "Just about every cache of weapons we've found has been the result of someone coming forward."[23] Once again, unfortunately as an outside observer we do not have any quantitative information on the rate at which this is happening.

Unfortunately, as Taw observes, "The United States has neither the manpower, the budget, nor the will to develop HUMINT capabilities in all the developing countries that might face insurgencies."[24] This implies that the US should be able to quickly establish HUMINT assets on demand, which it is slowly learning by trial and error.

In conclusion, coalition HUMINT capabilities seem to be shaky, but this is fairly good considering that there was not any preparation before going in. What information they did get during the first six to nine months after the war was very useful, but now they seem to be getting less intelligence as the number of weapons stockpiles, fugitives, and possibly insurgents are decreasing. This, nevertheless, does not prove that public opinion is waning.

Civil Action / Infrastructure

In short, the CPA has spent billions of dollars on rebuilding Iraqi infrastructure, and plans on spending much more over the next few years.[25] Most of the spending is on projects like electricity, water sanitation, healthcare, and oil pipelines, as opposed to the good-will operations previously described. This does not imply that the former is a higher priority to the counter-insurgency campaign, however; it is likely a result of the order of magnitudes price difference in reconstructing, say, an electrical plant versus handing out toys for kids. There is currently only one active duty civil affairs battalion, and those forces are being over-stretched. As the US begins to see the public opinion impact of military-civil affairs campaigns, it is doubling the size of that battalion from 200 to 400 soldiers by 2005.[26]

USAID, a program providing civil action to Iraq, rehabilitated 2,358 schools during "the first term of the 2003/04 school year."[27] It has also "procured more than 30 million doses of vaccines since July 2003 with support form the Ministry of Health and UNICEF."[28] Out of the 282 hospitals in Iraq, only 12% are "damaged or looted." Using

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[23] American Forces Press Service, "Civil Affairs Mission Continues to Grow in Iraq, Afghanistan," April 29, 2004.

[24] Jennifer Morrison Taw & Bruce Hoffman, *The Urbanization of Insurgency, The Potential Challenge to U.S. Army Operations*, RAND Corporation, 1994

[25] For lots of information on infrastructure spending, see the Quarterly Reports on Iraq presented to the U.S. Congress.

[26] See footnote 22.

[27] See USAID Weekly Report #29, p. 7

[28] ibid, p. 6

about $150 million, the Iraqi healthcare system should be very operational in the next year or two.[29]

As Iraqi infrastructure continues to come online through 2005, public optimism about Iraq's future is likely to increase even past the high hopes of today, but this might not carry over to improvement in coalition approval. Even if it does not improve the coalition's image, it is likely to improve Iraq's domestic security and the government's strength due to national perceptions.

Law & Order

Efforts over the past year seem to have reduced the crime rates, although quantitative information is not available. Saddam pardoned all criminals in Baghdad before the US invasion,[30] but the high ratio between the police/coalition forces and the population has allowed the cities to be fairly calm. Senor notes that, after bringing Iraqi police into Basra, "[its] crime rate…has dropped 70 percent during [the last two months]."[31]

Calculating the police to population ratio is a difficult thing, since it largely depends on which forces are counted as police. It makes sense to count the counter-insurgency forces here, since they do patrols around cities and work in conjunction with the newly formed Iraqi police. Thus, the police to population ratio is about eight to one thousand, a very sizable number.[32]

Number of Insurgents

The analysis of the relevant metrics will show that during the beginning of the counter-insurgency there were relatively large numbers of insurgents. With time, the coalition attrited many of these, by capturing, killing, or deterring them. Recently, however, large numbers of latent insurgents have been mobilized. This latent soldier mobilization should serve as a reminder that political forces matter, and keeping an eye on such potential militias is important.

The bulk of the justification for this analysis comes from analysis of coalition death rates. Rate of attack information is more useful for mid-2003 analysis, and would be more useful if more accurate data was available. Foreign fighter immigration would also be nice information to have numbers on, but what information there is suggests it to be a significant factor.

Rate of Attacks

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[29] See Iraq Sectoral Conferences, Third Series, Transcript: Health Consultation; September 25, 2003 for much more information

[30] Army Major General Buford, 3rd Infantry Division Commander Briefing from Iraq, May 15, 2003

[31] American Forces Press Service, "Iraqi Police Positively Affecting Security, Officials Say," February 3, 2004.

[32] For comparison, in the United States the police to population ratio is about three to one thousand. (Federal Bureau of Investigation, Department of Justice, *Crime in the United States 1993, Uniform Crime Reports for the United States 1993*, Washington: GPO, 1994)

In an October 2003 news briefing, coalition officials said "The number of attacks fluctuates. The beginning of May saw six to 30 attacks each day. The upper number has dropped; in October, the average has fluctuated from the mid-teens to low 20s."[33] Later in October, officials said that they saw an increase in activity, 80% of which was in the Sunni triangle.[34] The explanation for the increase was "because of increased coalition pressure on Baathist holdouts, foreign terrorists and criminal elements in the country."[35]

In a February 2004 briefing, Dan Senor said "In November we were getting roughly, somewhere on the order of 50 attacks against coalition troops on a daily basis. We're down to about 20, 15 to 20 per day."[36]

These trends make sense. A possible high level explanation is that coalition forces first swept through the country, without concentrating on taking their time to pacify each city as they went. This wide sweep caused them to run into several pockets of resistance. Then, the numbers go back down around August and September. Later, coalition officials started to tighten their hold and consolidate the cities, which increased the number of incidents once again. The level of violence then went back down, until al-Sadr's militia took to arms in April 2004. [37]

The question becomes: how does this translate to the number of insurgents? The answer is unclear. Due to the effect outlined in the previous discussion on rate of attack analysis, it is likely that there is still some number of less active insurgents which will be the hardest to locate and kill.

Counter-Insurgent Death Rates

The number of coalition deaths per month is illustrated in Figure 3. This trend matches up with the trend on rate of attacks given above.

Foreign Fighter Immigration and Border Patrol Run-ins

This is a problem that was recently identified and addressed by coalition officials. According to a March 2004 news article, "The Coalition Provisional Authority announced a new policy today to tighten border security in Iraq, an effort officials say will help stem the flow of terrorists and foreign fighters entering the country."[38] This overhaul involved "doubling Iraq's border patrol force from 8,000 to 16,000, as well as increasing the number of immigration officers on duty from 86 to 1,000."

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[33] American Forces Press Service, "Number of Attacks in Iraq Constant, Enemy Tactics Change," October 6, 2003.
[34] American Forces Press Service, "Number of Incidents in Iraq Up, Officials Say," October 24, 2003.
[35] Ibid.
[36] Army Brigade General Mark Kimmitt and Dan Senor, Briefing, February 23, 2004
[37] See American Forces Press Service, "Coalition Working to Pacify Fallujah, Destroy Sadr Militia," April 8, 2004.
[38] American Forces Press Service, "CPA Announces Measures to Tighten Border Security in Iraq," March 13, 2004.

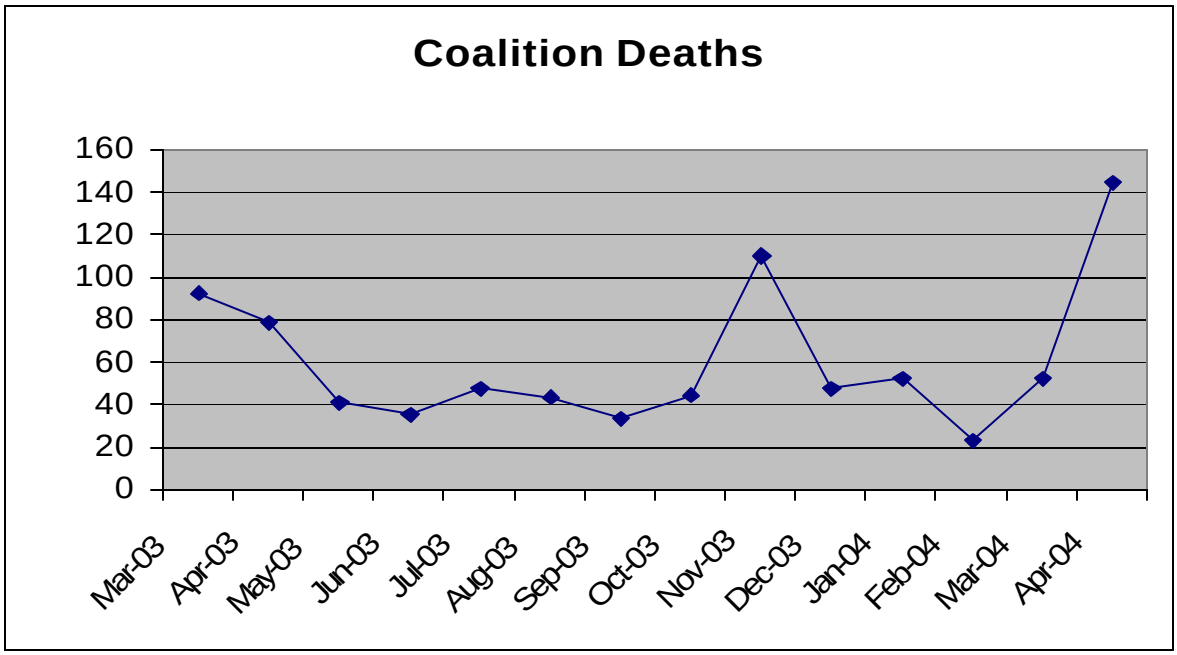

Figure 3. Coalition deaths since the invasion of Iraq

This tightening security was first focused towards the Iranian border. More recent encounters, however, have occurred on the Syrian border.[39] Furthermore, the foreign fighters seem to be a significant portion of those currently waging the large battle in Fallujah.[40]

While foreign fighters are present and seem to be a significant factor, we do not have the raw run-ins information needed to estimate how many there are.

Skill of Insurgents

From the analysis given below, it is apparent that while few insurgents have real war-fighting skills, they have become good at invoking the maximum amount of damage while minimizing casualties.

Coordination Level of Attacks

There does not seem to be any coordination or sophistication of attacks today. "Enemy forces are moving away from small-unit infantry attacks against coalition forces. Regime holdouts are moving toward more hit-and-run attacks, using improvised explosive devices, mortars or rocket-propelled grenades."[41]

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[39] American Forces Press Service, "Insurgents Going 'to Any Lengths' to Stop Iraq's Progress, Myers Says," April 18, 2004.
[40] Dan Senor, Senior Advisor, CPA, Coalition Provisional Authority Briefing, April 16, 2004.
[41] American Forces Press Service, "Number of Attacks in Iraq Constant, Enemy Tactics Change," October 6, 2003.

There are some instances, however, of higher level coordination. For example, on October 27, 2003, four coordinated suicide attacks in Baghdad killed 43 people and wounded over 200. Also, on November 29, 2003, "Two U.S. soldiers, seven Spanish intelligence officers, two Japanese diplomats, and a Colombian oil worker [died] in separate guerrilla attacks."[42] These type of events imply either large cells or inter-cell orchestration. It is likely that insurgents coordinate to execute these types of attacks when their geographical density is high enough, and that otherwise they operate autonomously.

Attacking Hard but Lucrative Targets?

Perhaps the best example of a hard but lucrative target is a prison. Prisons are likely to be well guarded, but probably house some of their fellow insurgents, along with some criminals which will undermine law and order. The only such event of note occurred on February 14th, 2004.

> "Roughly 70 guerrillas firing rockets, mortars and machineguns raid police headquarters and the Iraqi Civil Defense Corps (ICDC) in Fallujah in an effort to free foreign prisoners. 15 policemen, four insurgents and at least four civilians die in the attack. The dead guerrillas appear to be Lebanese and Iranian nationals. At least 70 prisoners escape, many – 18 by one account – flee with the attackers."[43]

Although this is a singular incident, massing and coordinating a 70-person attack on a prison is not a trivial thing to do in an urban environment policed by counter-insurgents. As we know, Fallujah is now (almost three months later) a hotbed of insurgent activity.

Types of Weapons Being Used

As seen in Figure 4, which illustrates the weapons used to kill each counter-insurgency soldier so far in the campaign, the insurgents are not very advanced. The more advanced of these weapons, snipers and landmines, are used least often.

Are Attackers Surviving?

In theory this should be a reasonable thing to try to measure; in reality, though, the high level reports published make it difficult at best. It seems like insurgents are widely using hit and run tactics[44] in order to maximize their survival rate. How successful they are at that is not a measurable thing without detailed reports of each encounter.

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[42] Stephen Lanier, "Low Intensity Conflict and Nation-Building in Iraq: A Chronology," April 2004.
[43] Ibid.
[44] Transcript with Deputy Secretary of Defense Paul Wolfowitz, October 26, 2003.

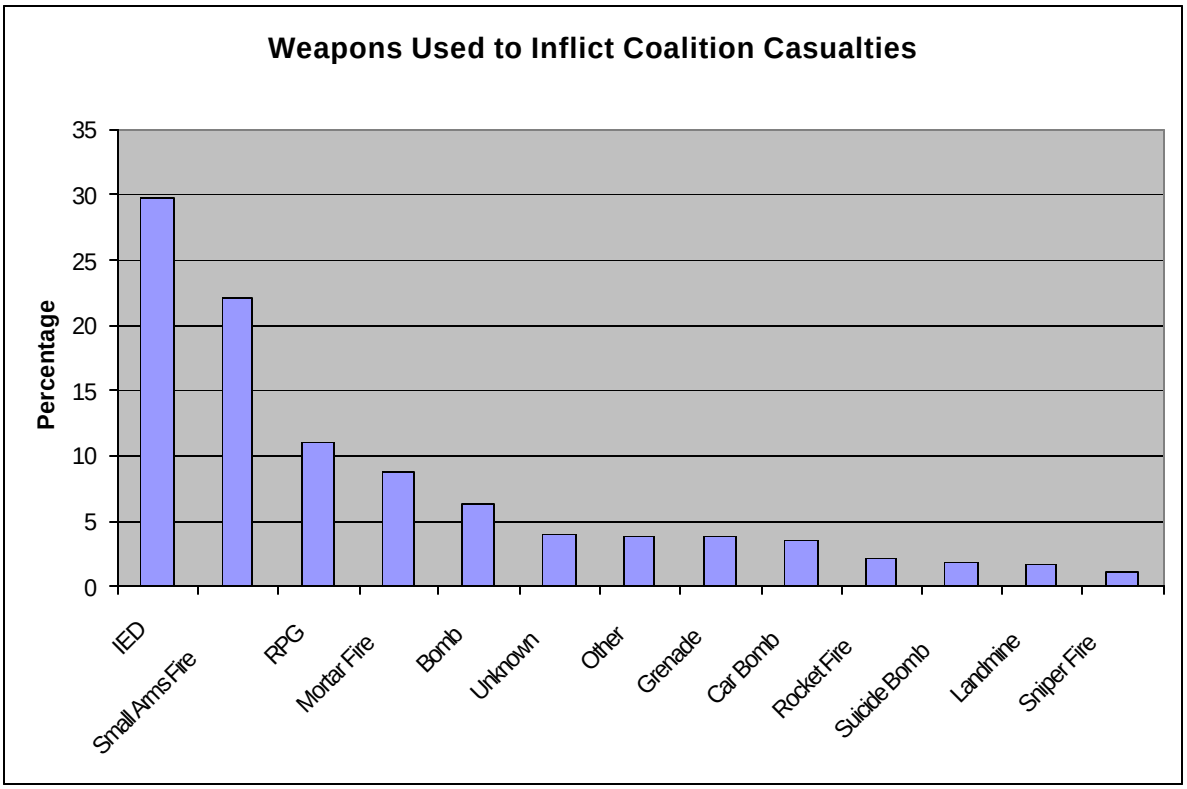

Figure 4. Percentage of causes of coalition deaths in the counter-insurgency.

Number of Counter-Insurgency Forces

The mixing of coalition forces with the New Iraqi Army, the Iraqi Civil Defense Corps, and the Iraqi police makes counting the total counter-insurgency forces a difficult thing to do.[45] Rough estimates say that there are currently 146,000 coalition troops[46]; 40,000 ICDC personnel[47]; 5,000 New Iraqi Army forces[48]; and about 80,000 police.

Numbers can very easily be misleading, however. Differences in levels of training, especially in the current disparate environment, can be significant. We will have to pay special attention to their skill levels.

Skill of Counter-Insurgency Forces

Although this paper does not discuss this topic in much detail, the coalition has proven to be fairly good at C_3I (Communications, Command, Control, and Intelligence), which is needed to handle the dynamic environment of urban insurgency. On the other

[45] The problem gets even more complicated. For example, should facilities protection forces be counted as counter-insurgents? At least it is not as difficult as counting the insurgents, though.
[46] Summing the current US Order of Battle and Non-US Coalition forces, as of April 29th, 2004.
[47] First Quarterly Report to US Congress on Iraq, Part IV Main Report, p. 31
[48] This number is hazy, due to the rapid pace of current training and the existence of partially-trained or in-field-training privates.

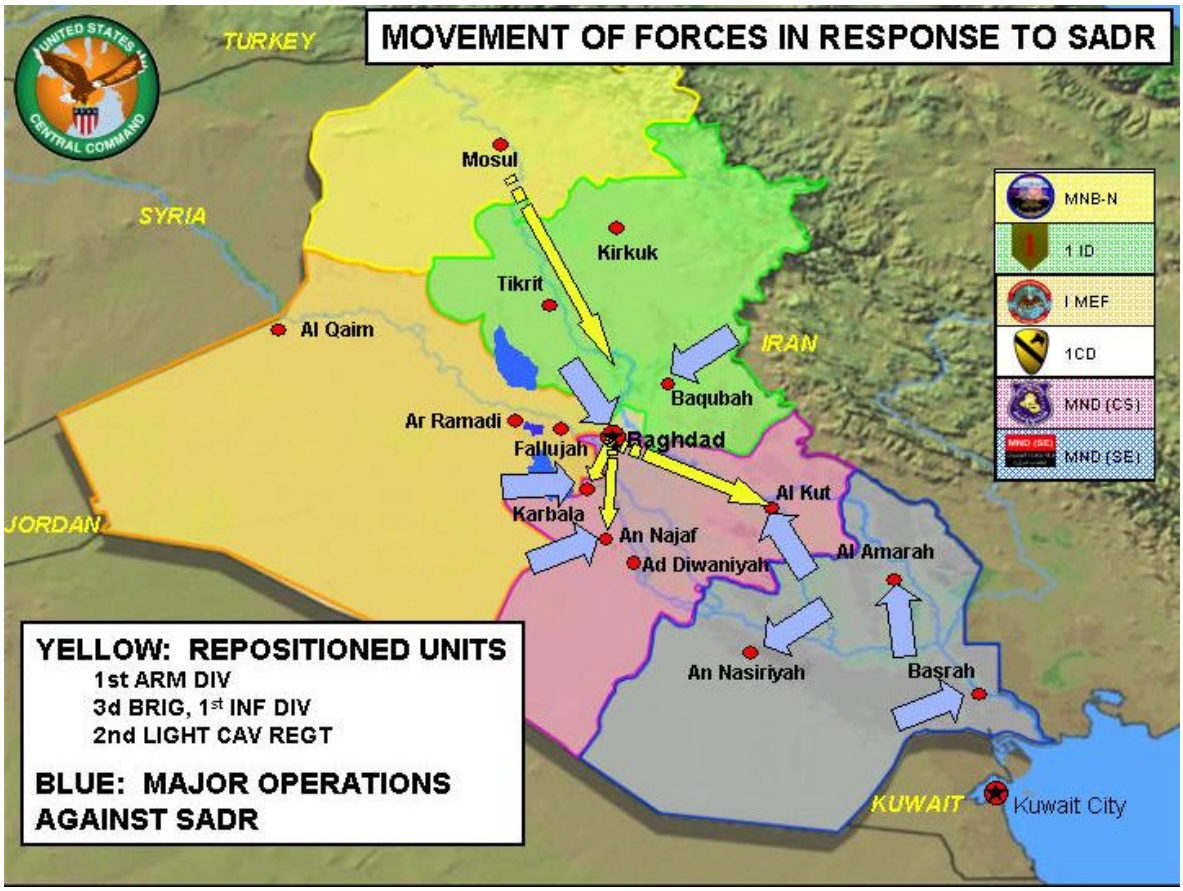

Figure 5. Troop movement in response to insurgent uprisings, April 2004.[49]

hand, they leave much to be desired in the areas of HUMINT, getting into the population, and other insurgency TTP.

The native forces (NIA, ICDC, and Iraqi Police) are far less skilled and equipped. The CPA realizes this, though, and is "interlarding" them with the coalition for training purposes.[50]

Number of Foiled Attacks

It does not seem like many attacks are being thwarted. On February 18, Polish troops stopped twin suicide car bombs.[51] Other foiled attacks probably occur but are not reported to the public because of perceived insignificance.

Speed and Effectiveness of Responses to Uprisings

Figure 5 illustrates the response of CENTCOM to the high levels of insurgent activity created by the al-Sadr militia in April 2004. In this incident, the coalition

[49] Department of Defense News Briefing, April 30, 2004.
[50] This means that the native forces are embedded, or operate in combined units with the coalition forces.
[51] Stephen Lanier, "Low Intensity Conflict and Nation-Building in Iraq: A Chronology," April 2004.

demonstrated high levels of coordination and command. Aside from the speed with which the movement was executed, the troops came from the most strategic points according to our analysis. More specifically, we found that the current situation is best in northern Iraq, where coalition moved troops from.

Conclusion

The analysis presented in this paper posits several conclusions. First, we have found multiple indicators that agree on general trends in the insurgency's abilities (i.e. rate of attack and coalition death statistics), and have explained each feature of the curve.[52]

We have also shown that the future of Iraq, in terms of public opinion, is hopeful. The two main things threatening Iraq's current military stability seem to be the insurgency and the dependence on coalition forces. Politically, our discussion suggests that the coalition should use any means necessary to prevent new militia from uprising, and that the question of balance of power between ethnicities and religion should be settled soon.

In terms of metrics, these suggestions were derived from the metrics which are cause revealing. As a whole, the metrics we used were appropriate and useful, although some of them could not be easily measured by an outside observer. There certainly is a host of other metrics that could be used,[53] but the style of analysis and thinking remains the same.

[52] Described in detail under rate of attack analysis, the three spikes are from beginning effects, tightening and consolidation effects, and the rise of the al-Sadr militia.

[53] For example, the occurrences of protests might measure public opinion.