The Precision of Drones: Problems with the New Data and New Claims

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Alarming evidence has emerged that drone strikes outside areas of active hostilities kill more civilians than strikes by manned aircraft in more conventional theatres of war. For example, Micah Zenko and Amelia May Wolf published an April 25th article in *Foreign Policy* claiming that independent public databases showed that "drone strikes in non-battlefield settings – Pakistan, Yemen, and Somalia – result in 35 times more civilian fatalities than airstrikes by manned weapons systems in conventional battlefields, such as Iraq, Syria, and Afghanistan." This finding was then seemingly corroborated – although surely unintentionally – on July 1st when the Obama administration released its long anticipated official records of civilians killed outside areas of active hostilities (such as in Pakistan, Yemen and Somalia). When compared with official data on civilian casualties on the conventional battlefields of Iraq and Syria, these new numbers suggest that drone strikes kill over 59 times more civilians per strike. Critical articles questioning the precision of drones appeared immediately in the New York Times, Washington Post and elsewhere.

The intense interest in this new evidence of the relative inaccuracy of drone strikes is entirely understandable. If it is correct, it would imply that the Obama administration's counterterrorism policy has been built on a falsehood. As Zenko and Wolf put it, "The Obama administration's assumption that drones cause less collateral damage than piloted aircraft is simply untrue."

Such a conclusion would reveal that the public has been misled by senior officials of the Obama administration and by the President himself, all of whom have lauded the comparative precision of drone strikes. The President remarked on April 8th at the University of Chicago Law School that "What I can say with great certainty is that the rate of civilian casualties in any drone operation are far lower than the rate of civilian casualties that occur in conventional war." In 2012, his Secretary of Defense, Leon Panetta, said of the combat drone, "I think this is one of the most precise weapons that we have in our arsenal." The prior year John O. Brennan, then the President's Senior Counterterrorism Advisor and now the Director of the CIA, bragged that "there hasn't been a single collateral death because of the exceptional proficiency, precision of the capabilities we've been able to develop" with drones (although the accuracy of his claim that no civilians were killed in the year prior to his statement has been widely disputed).

Moreover, if the evidence of drone imprecision is accurate, then U.S. drone strikes outside conventional battlefields would violate fundamental principles of both international law and conventional morality. Knowingly using imprecise drone strikes would breach the legal principle of precaution which requires states to use the least harmful means available to accomplish their legitimate military purposes (Rule 15, Customary IHL). It would also contravene the "due care" principle of contemporary Just War Theory, which requires that the safety of civilians be privileged over that of soldiers (including pilots). At very least, these principles would seem to ban the continued use of drones now that this evidence of imprecision has come to light.

In short, if the claim about the relative imprecision of drones is true, it demands a complete re-thinking of U.S. counterterrorism policy (in which the drone has been "Obama's Weapon of Choice," as Peter Bergen and Megan Braun aptly put it). And it would represent a major setback for the President and his team, as well as a major embarrassment for the country.

However this article argues that we are not quite there yet. While some of this data is undeniably troubling, it has often been misread and misrepresented and its implications exaggerated. In fact, the most recent evidence provides some support for the U.S. administration's claim about the precision of drones. As a result, we will argue that it is much too early to draw any definitive conclusions about the comparative precision of drones. The data available is simply too sparse and unreliable. In addition, there is some evidence which suggests that the precision of the drone campaigns is rapidly improving.

To make this argument we will analyze the new Director of National Intelligence (DNI) report and the recent article by Zenko and Wolf. Though we end up criticizing both sides of the debate, we do not see our article as vindicating the claims of U.S. officials, nor as dismissing the valid concerns that have been raised about civilian casualties with drones. Its point is rather to call into question what strike us as premature declarations of the truth or untruth of an increased precision with drones. Our contention is that there are in fact a host of legitimate worries when it comes to the current usage of unmanned armed vehicles across international borders, and these questions need to be confronted rather than side-stepped by premature declarations about the relative tactical (im)precision of drones.

General Problems

The current concerns about the relative accuracy of drone strikes have been fueled primarily by comparisons between the predominantly manned air campaigns in Iraq and Syria and the drone-dominated campaigns in Pakistan, Yemen and Somalia. Such comparisons, however, suffer both from general limitations inherent in the character of the campaigns themselves and the data available on them, as well as from specific limitations arising out of the particular ways commentators have attempted to evaluate the available figures. To flesh out the various problems the following discussion begins with some general issues and moves towards more specific ones.

Perhaps the most basic limitation of comparing the precision of manned aircraft versus drone strikes across the various air campaigns is that none of them provide a perfect proxy for either drone or manned strikes. It is true that the air campaigns in Pakistan, Yemen and Somalia have been dominated by drones (which account for around 95% of strikes, according to New America Foundation (NAF) numbers), while those in Iraq and Syria have relied primarily on manned aircraft (which have carried out 66% of sorties and 93% of weapons releases, according to data provided in March by Air Force Central Command).

However, the fact remains that both groups of campaigns involve mixtures of weapon platforms, and most data sources (including all government sources) fail to distinguish between which weapons platforms carried out which strikes. So it is often not clear on either side of the comparison which platforms are causing the most harm to civilians. For example, a number of the worst strikes in terms of civilian casualties in Pakistan, Yemen and Somalia (as well as in Afghanistan, as will be seen below) have been carried out not by drones but by manned aircraft or missiles. To raise just one example discussed by the *Washington Post,*

The strike that reportedly produced the highest number of civilian casualties [of those examined by Human Rights Watch] came toward the end of Obama's first year in office, when ship-launched cruise missiles carrying cluster munitions killed 14 suspected al-Qaeda fighters in Yemen but also as many as 41 civilians. According to Human Rights Watch and an investigation by the Yemeni government, there were 21 children and nine women among them.

If the U.S. included these 41 civilian deaths in its minimum count of 61, then they alone would account for over two thirds of its recorded civilian deaths in Pakistan, Yemen and Somalia between January 2009 and December 2015. Yet if these campaigns are treated as a proxy for drone performance, those strikes are effectively attributed to drones, and as a result distort comparisons with predominantly manned campaigns (such as Iraq and Syria). As we will see below, this is a recurring error that cannot be corrected without the disclosure of – and attention to – more detailed information on all types of airstrikes.

Another very basic limitation in comparing airstrikes in Pakistan, Yemen and Somalia with data from Iraq and Syria is that the environments differ critically. The former are clearly asymmetrical conflicts outside hot battlefields where virtually all targets embed themselves deeply in civilian environments; the latter are occurring within more

conventional armed conflicts and are closer to traditional combat where the enemy defends territory, engages in sustained battle on fronts and in strongholds, concentrates forces to attack or defend, and where aircraft are often used in close air support. This difference certainly alters the challenges of precision significantly. So when comparisons of precision are made across the environments, they are made across a very uneven playing field.

Specific Problems

In addition to the foregoing general limitations, the specific data and methodologies that have been used in making manned aircraft v. drone comparisons across these campaigns involve some difficulties as well. For example, if we consider the official data on drone strikes released on July 1st, at least four key issues deserve note. With regard to other data sources frequently used in comparisons, at least two further issues demand consideration.

1. Civilians v. Combatants

First, the data released by the DNI is limited to the total number of strikes under Obama up to the end of 2015, and the possible range of overall civilian casualties during that time. One resulting problem is that it is hard to assess the credibility of the data. The reason for this is that we cannot see how specific cases are assessed (particularly in regard to who they are classifying as combatants and non-combatants). Indeed, this lack of detail compounds a deeper problem common to all attempts to count civilian casualties. It is that the difference between civilians and combatants remains a hotly contested legal question in this type of non-international armed conflict. One way to comprehend the frustrating complexity of these categories and subcategories is to look into the legal history and debate over the different possible delineations (a useful overview to begin can be found here).

In short, members of the armed forces may be considered combatants in all forms of conflicts, but other individuals who attack a state are not at all easily classified; international organizations and certain states have long disagreed over the standards for a person to qualify as a fighter or combatant. While there is general agreement that “civilians are protected against attack, unless and for such time as they take a direct part in hostilities,” the lawfulness of a strike on a person who is not a member of the armed forces depends on what exactly constitutes this “direct participation in hostilities” and when it begins and ends (Rule 6, Customary IHL). Evidence of the longstanding controversy over these issues runs throughout the first 24 rules of customary humanitarian law. For example, the International Committee of the Red Cross (ICRC) commentary on Rule 3, Customary IHL (the “Definition of Combatants”) explains with revealing frankness that “practice is not clear as to the situation of members of armed opposition groups” when they are not actually engaged in fighting. That is, do they regain the immunity of civilians or can they be targeted like combatants?

In the newly released DNI document some general criteria have been put forward:

The U.S. Government draws on all available information (including sensitive intelligence) to determine whether an individual is part of a belligerent party fighting against the United States in an armed conflict; taking a direct part in hostilities against the United States; or otherwise targetable in the exercise of national self-defense.

However, these categories largely side-step the issue rather than clarify it. While the second category—those “taking a direct part in hostilities”—is both recognized internationally and more objective, the other two standards are more controversial and leave a great deal of wiggle room and uncertainty. In particular, the criteria for being considered a part of a belligerent party, the boundaries of application for the laws of armed conflict and the trigger of an imminent threat for national self-defense (from an individual rather than a state) remain undiscussed and undefined.

Hence when using the number of civilians killed as a measurement of accuracy, it must be understood that this is already a loaded inquiry that can only be fully understood when knowing the definitions of combatant and civilian being applied. Without such information, from both the government and independent fact-finders, measurements of accuracy will always be contestable and muddled.

2. What Does the Data Include?

Second, it is not entirely clear what regions the data covers. The DNI document refers to "Counterterrorism Strikes Outside Areas of Active Hostilities", and that is commonly assumed to refer to Pakistan, Yemen and Somalia. However, some commentators assume that it also refers to Libya as well. Moreover, there are reasons to think that it may actually exclude some Pakistan strikes, which U.S. officials have at times described as part of the area of active hostilities spilling over from the Afghanistan conflict. The total of 473 strikes is indeed noticeably lower than any of the independent counts for Pakistan, Yemen and Somalia (although this could also be explained by the claim made in the DNI statement that some strikes by local air forces have been blamed on the U.S.).

3. *No Breakdown by Date and Region*

A further difficulty is that the data cannot be broken down in terms of time or region and therefore obscures important differences of performance (including improvement over time). Over the life of the drone campaigns rules of engagement have been tightened, attitudes to civilian casualties have evolved and the accuracy has noticeably improved as the vast majority of the civilian casualties from drone strikes occurred before 2011 (see chart below). As the Iraq and Syria strikes began in August 2014, an arguably more apt comparison would be between the performance of manned strikes and drones since then. When the campaigns are compared in this way, across the same period, the results actually suggest that drones are comparatively more precise (again, see below).

4. *Signature Strikes*

Fourth, there is the difficult issue of accuracy when the government itself does not know precisely who it is targeting. While the practice of "signature strikes"—that is, the targeting of groups of men believed to be militants based upon their patterns of behavior but whose individual identities are not known—was first revealed in a 2011*Wall Street Journal* article, it was thought to have been curbed, or perhaps even abandoned, after Obama's well-publicized Presidential Policy Guidance (PPG) was signed in May 2013. Now, however, we have learned that the PPG of 2013 never actually applied to parts of Pakistan, and that Yemen has fallen into a similar category, clearing the way for the use of such signature strikes there. Considering that the great mass of armed drone operations outside the territory of an armed conflict have been carried out in these two countries, not only is it problematic that the controls on deadly force continue to be misrepresented and are subject to change where it matters most, it also makes the counting of civilian casualties more difficult.

While there certainly are instances where combatant/fighter status can be confidently determined by observation of behavior (for example, where those observed are "directly participating in hostilities" by carrying out attacks or planting bombs) the U.S. government has never provided a public accounting of the criteria it uses to identify legitimate targets and there are widespread reports that it has used at least some criteria that fall far short of certainty. The result is to undermine the reliability of official U.S. counts of civilians (and combatants) killed.

Moreover, it should not be overlooked that there are no available figures on the number of signature strikes that have taken place. There are, at best, some general indicators. For example, reporting on the initial disclosure of this practice indicated that "The bulk of CIA's drone strikes are signature strikes." In addition, multiple non-government reports citing unnamed officials have led leading scholars of the strikes to concur that "The vast majority of drone strikes conducted by the CIA have been signature strikes." By consequence, whatever doubts attach to the targets of signature strikes would likely apply to most of drone strikes outside areas of active hostilities.

Of course, these types of limitations are not unique to the data provided by the DNI on strikes outside of conventional armed conflict. There are also important limitations in the data with which it is frequently being compared.

5. Iraq/Syria Numbers and Data Lag

For example, there are serious reasons to be concerned about the completeness of the data provided by the Combined Joint Task Force (CJTF) concerning air strikes in Iraq and Syria, particularly when it is compared to the DNI data from Pakistan, Yemen and Somalia (from 2009 to 2015). There is, for instance, often a lag that arises in officially recognizing civilian casualties. Since the entire data set from Iraq and Syria covers the last two years, it is

likely that there are many more civilian casualties that will eventually be added to this data. For example, just at the end of June the U.S. military reopened an investigation into a 2015 airstrike near the Iraqi city of Mosul after a *Washington Post* investigation suggested that it resulted in eleven civilian casualties. In April it was reported that the "U.S. military was also looking into another 25 allegations of airstrikes that caused civilian casualties that have been 'deemed to be credible'." By contrast, the data from Pakistan, Yemen and Iraq stretches back almost eight years and has been painstakingly reviewed and prepared for public presentation so it is less likely that large numbers will be added.

The potential impact of data lag on the comparative campaign data can be illustrated by contrasting the deviation between official reports and independent databases (which are continually updated) across the campaigns. The U.S. government reporting of civilian deaths in the longer running campaigns in Pakistan, Yemen and Somalia range from a little under 1/2 of the independent databases to a little under 1/4 depending on which you consider (64 to 116 under Obama according to DNI vs. 212 according to LWJ or a minimum of 325 according to TBIJ).

However, the official count in the Iraq and Syria campaign is currently around only 1/34th of that reported by the independent database tracking strikes (41 civilian casualties vs. 1,422 reported by Airwars). This is a remarkable difference that currently makes the primarily manned air campaign look astonishingly accurate, but suggests a considerable likelihood of future upwards revisions in reported civilian casualties.

In this regard, it is useful to take note of the July 19th report of civilian deaths from strikes by coalition bombers and fighter aircraft near the city of Manbij, Syria which, if correct, would involve the largest number of civilians killed in any strike in the entire campaign to date. At the time of this writing, Airwars has estimated between 73 and 212 civilian deaths. The U.S. military has opened a formal investigation and a confirmation would already tilt the calculations of precision sharply in favor of drones. As a result, this lag time now in existence is another real difficulty for trying to crunch the numbers correctly.

6. Difficulties and Dangers in Pakistan and Elsewhere

It must also be acknowledged that the main unofficial sources of data on the precision of U.S. air strikes in Pakistan, Yemen and Somalia, specifically the independent open-source databases tracking the strikes, suffer from important limitations. Chief among these is that they rely primarily on news reports which frequently contradict one another and are often of dubious reliability. Some areas, like the FATA region of Pakistan (Federally Administered Tribal Areas) where most U.S. strikes have taken place, are closed to outside reporters, and accounts often must be pieced together from diverse local sources and officials, each of whom may have an agenda. Furthermore, the independent fact-finders who do sneak into the region have often found themselves in perilous situations. There are reports that they have been targeted by both the non-state armed groups and the government alike. Indeed, similar issues arise in connection with the independent count of civilians killed in Iraq and Syria.

Problems with Zenko and Wolf's Numbers

In addition to the foregoing limitations in the data sources, three difficulties in particular arise with the way Zenko and Wolf design their comparison between the Iraq/Syria and the Pakistan/Yemen/Somalia campaigns in their *Foreign Policy* article.

Most importantly, Zenko and Wolf are actually comparing two entirely different measures. They take as the basis of their comparison the "bombs and missiles dropped" in Iraq and Syria, and compare these to drone "strikes" in Pakistan, Yemen and Somalia. But these measures are not at all the same as drone strikes often involve the firing of many missiles. The effect of this unequal comparison is to inflate the precision of manned aircraft and depress that of drones.

To get a sense of the magnitude of distortion one only needs to look at the front page of their primary source on airstrikes in Iraq and Syria, Airwars: 44,402 "bombs and missiles dropped" in 12,896 "coalition strikes" (as of June 9th). As can be clearly seen, these categories diverge by a factor of nearly 3.5 times. The result is not simply an

incorrect comparison of apples to oranges, but rather compares apples to crates of apples.

A second difficulty which arises in the comparison that Zenko and Wolf offer is that they incorporate the very low official government count of civilian casualties recognized to date on the Iraq/Syria side, but not the Pakistan/Yemen/Somalia side. Specifically, they shrink the count of civilian casualties at Airwars (1,118 at the time of their writing) by averaging it with the 35 civilian deaths officially acknowledged at that time by the U.S. Department of Defense (DoD). This effectively cuts the total (nearly in half) down to 577.

However, they do not incorporate any DoD or CIA data on the other side of the equation (i.e., the Pakistan/Yemen/Somalia numbers). The obvious explanation for this last omission is that no comprehensive government accounting existed at the time of their analysis. Nonetheless, given that the government data is in both cases way out on the low end of the spectrum, a balanced comparison would seem to require either that it be included on both sides or neither.

To better see the problems created one might look at it in this way:

- If the new DNI results are factored into Zenko and Wolf's Pakistan/Yemen/Somalia, this alone causes civilian casualties to fall from one death each 1.6 drone strikes to one every 2.5 drone strikes.
- If the DoD data is factored out of their Iraq/Syria data, that causes civilian casualties from manned aircraft strikes to rise from one every 72 strikes to one every 37 strikes.

A final difficulty with the comparison presented by Zenko and Wolf relates to the comparison of different periods of time. The primarily manned aircraft campaign in Iraq and Syria covers only the last two years, while the data Zenko and Wolf (and DNI) present on Pakistan/Yemen/Somalia covers around seven years. As the Iraq and Syria strikes began in August 2014, an arguably more revealing comparison would be between the performance of manned strikes and drones since then. To demonstrate the important effect of comparing over the same period we have compiled the relevant data in a chart found below.

1. An Alternative Analysis

Fortunately, it is possible to make a comparison over a similar period with most of the data sources employed by Zenko and Wolf (specifically from the start of the air campaign in Iraq and Syria to the present, or June 9th to be specific, when these calculations were made). For the following numbers we draw on the same independent databases tracking strikes in both campaigns as Zenko and Wolf used (Airwars on the Iraq/Syria side and the Bureau of Investigative Journalism (TBIJ), the New America Foundation (NAF) and the Long War Journal (LWJ) on the Pakistan/Yemen/Somalia side). Here we lay aside the new DNI and CJTF/DoD data, primarily because the former cannot be broken out for specific periods and secondarily because there are concerns about the completeness of the latter (both as explained in Section II).

This comparison, however, provides quite different results from those presented by Zenko and Wolf:

U.S. Airstrikes from 2014-16

Primarily Manned Aircraft

Iraq and Syria

(Airwars) **Primarily Drone Strikes**

Pakistan, Yemen and Somalia

(averaged from LWJ, NAF and TBIJ) Strikes Civilians Killed (minimum) Civilians Killed per Strike Strikes Civilians Killed (minimum) Civilians Killed per Strike

12,896

1,278

0.099

130

8.666

0.067

If the campaigns are compared on the same base of measurement (by strike), without the distortion produced by introducing DoD civilian casualties on one side only, and over this same time period (2014-2016), drones appear to be a little more precise. In other words, the rate of civilian casualties per strikes is *33% higher in Iraq and Syria,* where manned strikes predominate.

This result may initially appear anomalous, given how much higher the rates of civilian casualties looked in Pakistan/Yemen/Somalia in the data presented by Zenko and Wolf and that emerged from a direct comparison of the official numbers (35 and 59 times greater, respectively). The explanation emerges however from a year by year breakdown of the Pakistan/Yemen/Somalia numbers (here averaging TBIJ, NAF and LWJ numbers). The data is presented here to match Airwars, which presents a minimum civilian casualties estimate.

Airstrike Data for Pakistan, Yemen and Somalia (Averaging TBIJ, NAF and LWJ Data)

Year Strikes in Pakistan, Yemen and Somalia (average) Minimum Civilian Casualties

(average) Minimum Civilian Casualties per Strike (average) 2009 55.33 94 1.699 2010 116.67 42.33 0.363 2011 86 57 0.663 2012 102.83 26.33 0.256 2013 56.17 22.67 0.403 2014 48.33 5 0.103 2015 45 2.33 0.052 2016 36.67 1.33 0.036

Two key points in this data help to explain why comparing the whole period from 2009 to 2016 suggests that drones are comparatively imprecise (compared to strikes in Iraq/Syria), while comparing them over a similar period (2014-2016) makes them look comparatively more precise.

The first point is that the number of civilian casualties per drone strike fell sharply from around 1.7 in 2009 to 0.052 in 2015 and 0.036 in 2016 to June 9th (a reduction by a factor of more than 47 from 2009 to 2016). The other key point is that the number of strikes per year also fell sharply, from a high of over 116 in 2010 to a low of 45 in 2015 (we leave out 2016 here since the year is not yet complete). The implication is that the great majority of the strikes occurred in the earlier years of the period, so that when they are included they skew the results toward the higher rate of civilian casualties.

All of this helps to explain why, when one takes the aggregate data on Pakistan/Yemen/Somalia for the last seven plus years and compares it with the precision of strikes in Iraq/Syria over the last two years, the former looks quite bad. But when one looks over a comparable time period, the levels of precision look similar, and in fact the former (drone-dominated) campaigns come out looking a little better.

This data also at least suggests an alternative narrative of what has been going on. Specifically, U.S. targeting standards, procedures and performance have steadily improved over the last seven plus years, so that the recently-begun campaigns in Iraq and Syria were able to build on the standards already achieved with drones outside armed conflict, with the result that the Syria and Iraq campaigns as a whole have achieved very high levels of precision (U.S. Central Command spokesman Air Force Colonel Patrick Ryder has called them together "the most precise air campaign in the history of warfare"). On this view, the air campaigns in Pakistan/Yemen/Somalia are where these precision skills were gradually honed (in a more challenging environment) and so their results taken as a whole are noticeably less impressive than the recent performance in Iraq and Syria. The results in Pakistan/Yemen/Somalia over the last two years, however, also reflect more fully the improvements made over time, and now show even higher levels of precision than in Iraq/Syria in even more challenging targeting environments. On this alternative narrative, rather than being the poor cousin of manned flights in terms of precision, drones are a source of improved manned precision.

2. Clarifying the Data on Afghanistan

Evidence supportive of drone precision can also be found in examining data from Afghanistan—even though Zenko and Wolf suggest just the opposite. In particular, they point out that an increasing proportion of airstrikes in Afghanistan have been carried out by drones, rising to 56% last year. They then point out that there were 103 civilian casualties from coalition airstrikes last year. This is a bad number, despite being one lower than the prior year, given the sharply reduced number of overall strikes by international military forces (falling from 1136 in 2014 to 411 in 2015). This again gives the impression that drone use is correlated with a spike in the rate of civilian casualties.

However, a review of Zenko and Wolf's primary source (UNAMA report on civilian casualties) quickly alters first appearances. It reveals that 42 of the civilians killed in 2015 were from one remarkably disastrous strike *by a manned aircraft*. This was the October attack on the *Médecins Sans Frontières* Hospital in Kunduz by an AC-130 fixed wing gunship.

In other words, over 40% of the civilian fatalities from airstrikes for that year were brought about by one highly imprecise *manned* strike. Zenko and Wolf would certainly need to properly factor in such numbers to prove that the use of drones has reduced precision. In fact, the case by case breakdown of U.S. strikes in Afghanistan in 2015 compiled by The Bureau of Investigative Journalism suggests that only 30.43% of (minimum) civilian casualties (14 out of 60) resulted from reported drone strikes, although drones accounted for the majority of all U.S. strikes (91 out of 135 or over 67%). In other words, although less than a third of strikes were carried out by manned aircraft, these accounted for close to 70% of civilian casualties.

Moreover, if the results of the mixed campaign of manned and unmanned strikes in Afghanistan are compared with the campaign almost exclusively of drones across the border in Pakistan over 2014 and 2015 (2016 results are not yet available for Afghanistan), the results show that the drone strikes in Pakistan have been at least slightly more precise.

2014-2015 Drone Strike Data for Afghanistan (using casualty data from UNAMA and strike data from the Combined Forces Air Component Commander in Afghanistan) and Pakistan (Averaging NAF, LWJ and TBIJ data)

Afghanistan Data, 2014-2015 Pakistan Data, 2014-2015 Year Strikes Civilian Deaths from ISAF aerial strikes Civilian Deaths/Strikes Strikes Civilian Deaths Civilian Deaths/Strikes 2014 1136 104 **0.095** 23.67 0.333333 **0.014** 2015 411 103 **0.25** 11.33 2.5 **0.22**

The key point here is civilian deaths per strikes are higher in Afghanistan than Pakistan both for 2014 (0.095 to 0.014, or by a factor of more than six times) and 2015 (0.25 to 0.22). So here the drone-dominated campaign shows better precision than a mixed manned and drone campaign in recent annual data.

Conclusion

Although the data that we have examined is insufficient to vindicate the Obama administration's grand assertions about the relative precision of drones, it does cast significant doubt on Zenko and Wolf's proclaimed truth of the comparative precision of manned aircraft. In addition, it suggests the need for caution when it comes to drawing conclusions from comparing DNI data as a whole with recent results in Iraq/Syria given the many problems with numbers.

While the DNI report is an important step forward, the quantitative data available is still not yet of sufficient quality or consistency to make any definitive pronouncements on this question. It is therefore necessary to continue to press for more data, with a higher level of detail from the administration as well as to gather the best quality independent reporting.

Nonetheless, it is probably fair to say that the administration's case for the relative precision of drones has always relied more on an intuitive appreciation of drones' unique capabilities – a fixed

visual on the target for the crew, extended loitering times, combined with small laser-guided munitions – than the statistical evidence available. Put simply, the technological developments seem to offer at least opportunities to improve accuracy; how those opportunities are realized has become the pivotal question.

Indeed, just hours after the Zenko and Wolf article was published, we found ourselves participating in a conference on armed drones in Geneva, Switzerland where the provocative contention that drones have been less accurate than manned strikes in Iraq and Syria became a source of real debate among the participants. Nonetheless, while a number of deep concerns about drones were raised by the specialists present, there was little doubt that they at least bring with them the opportunity for improved tactical precision.

The intuitive idea that drones offer a capacity for increased precision coupled with other concerns about their use continues to be reinforced by recent reports from the field. A good example is the May 21st drone strike that killed Mullah Mansour, then the leader of the Afghan Taliban. It was reported that drone operators waited, shadowing him, until he had crossed out of Iran and into Pakistan and struck when his car was isolated on a highway as it sped towards a crowded city in Baluchistan Province. This required acuity, persistence, stealth and flexibility, along with pinpoint missile accuracy. It is difficult to imagine a manned aircraft performing this challenging mission as adroitly.

At the same time, the Mansour strike (like others) raises a host of troubling legal, moral and strategic questions beyond the tactical issue of precision. Those include, but are not limited to:

- The Pakistani government did not give its consent for the strike, so who holds the monopoly of legitimate force in that territory?
- Was the strike to eliminate a “roadblock to peace” or defend against an imminent threat?
- Is leadership removal strategically effective? Is there a link between drones strikes and retaliation?
- Is Baluchistan Province part of the battlefield where the laws of war are applicable?
- What are the human rights obligationsinside and outside of this battlefield?
- What precedents does this set/reinforce as this technology rapidly proliferates?
- Do such decisions to kill made by an unfettered executive erode the legitimacy of a government built on the separation of powers principle?

All of these are questions on which progress can be made while we continue to gather general data on drone performance and examine individual cases for details that reinforce or undermine the claim of precision. We suggest that at the moment our efforts are better devoted to gathering such data and making progress on these many difficult and consequential issues than to making premature proclamations of the truths and untruths of drone precision.

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