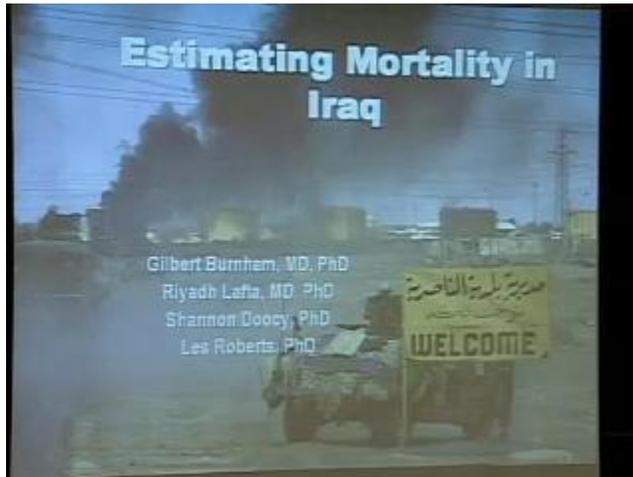


<http://web.mit.edu/humancostiraq/video-burnham/Burnham.html>
<http://mitworld.mit.edu/video/453/>

A transcript from "Counting the Dead in Iraq," a presentation at MIT by Professor Gilbert Burnham on February 27, 2007.

[Title Slide]



Philip S Khoury: May I have your attention please. If you'd be seated I'd be most grateful. Thank you. This is the Emile Bustani Middle East Seminar, it's in its 21st year, we have two sessions this semester only, our first today, and then again on March 20th, in this room, at this time, 4:30 or so. Dr. Kenneth Pollack, who is director of research at the Saban Center of Middle East Policy at the Brookings Institute in Washington, a number of you know him through his work on Iraq, and the War, and on Iran, he is coming to talk about Iran, War or Peace? And, you're all invited, this is open to the public, I hope you'll be able to join us.

It is a great pleasure to welcome Dr. Gilbert Burnham from the Johns Hopkins School of Public Health, he is co-director there of the Center for Disaster and Refugee Response, and is a professor of medicine, and he has enormous experience, as I'm learning, around the world, began his career in Malawi, he's worked extensively in East Africa; he has done work in the area of public health and medicine in Lebanon, in the Palestinian camps, and elsewhere around the world.

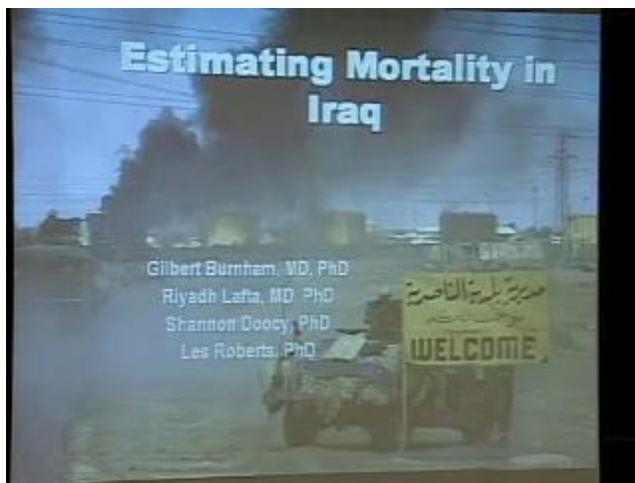
I guess he's best known to us these days for his work--his research--on how you count the dead in Iraq; it's a kind of gruesome, grim topic. He published an article in October of 2006 in the Lancet, a British medical journal, that got tremendous attention in this country and elsewhere, and has of course been contested, I gather, in Washington, not all of Washington, some sectors of Washington. And so we thought, and I thank my friend the Executive Director at the Center of International Studies which sponsors this with the Technology and Culture Forum, and John Tirman for bringing together with me into this seminar. we're delighted to have you, it's your show, and I'll just move over there so I can watch.

Gilbert Burnham: Okay, thank you very much for the introduction, and I'm going to stand up, as I usually do, because this is the way I look at whether my students are doing their emails or paying attention to class.

But I'm a bit cramped in style because a week ago or so I was in Rwanda, I was walking along, I stepped on a grate, the grate gave way and dumped me, and so I've got this boot on and my colleagues flashed the message back to Baltimore that said "Burnham's down the drain in Kigali".

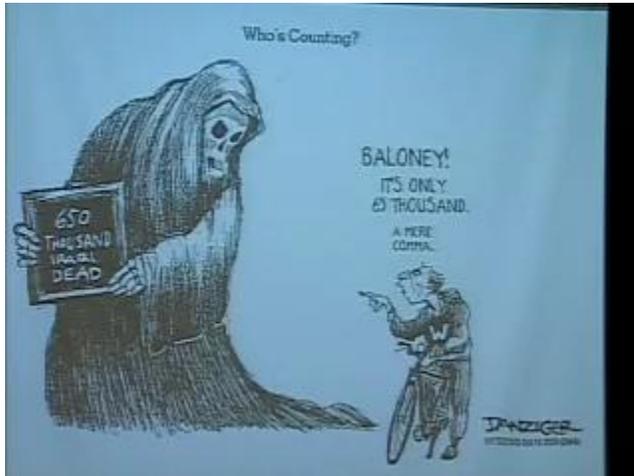
So here I am, and it's a pleasure to be here and to talk about the work we did in Iraq, and I think John was about over a year and a half ago, John called me up in Baltimore, and we started discussing what was involved in repeating the mortality survey that Les Roberts and several others had done in 2004, and one thing led to another, and I don't think I'm probably giving away too many secrets to say that the entire study cost somewhere less than \$60,000, I don't think I've done a study in my life where that kind of funds, particularly out of US government funding. So, one thing led to another, and that's what I'm going to talk about this evening.

[First Slide, same as title slide]



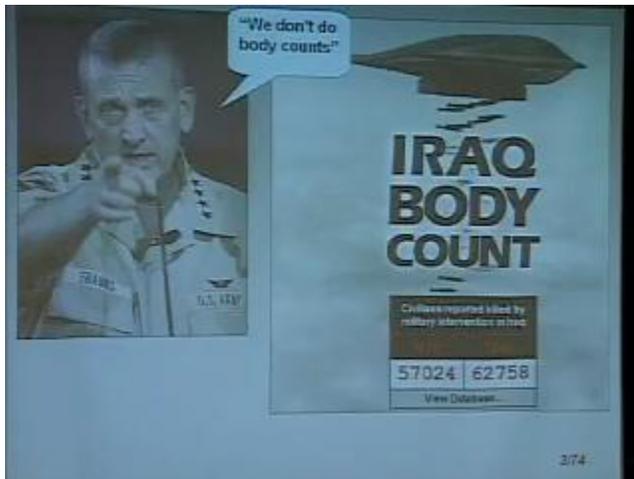
So we're going to talk about estimating mortality, and there's a team of four of us that were primarily involved. Riyadh Lafta is our team member in Baghdad, who carried out much of the field work. Shannon, along with several people in our biostatistics department, dealt with the statistical analysis of things, and Les Roberts, as some of you may know, was involved in writing the analysis of the work.

[4:25--"Who's Counting" cartoon]



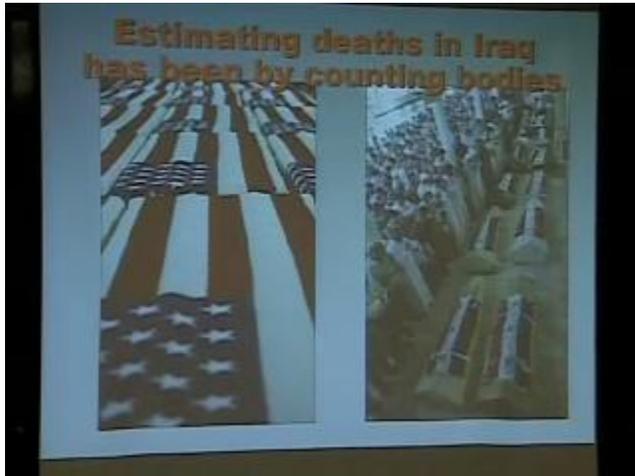
So, it's all about numbers, and where commas are located, and what does it really mean, and so forth.

[4:34--general and body count poster]]



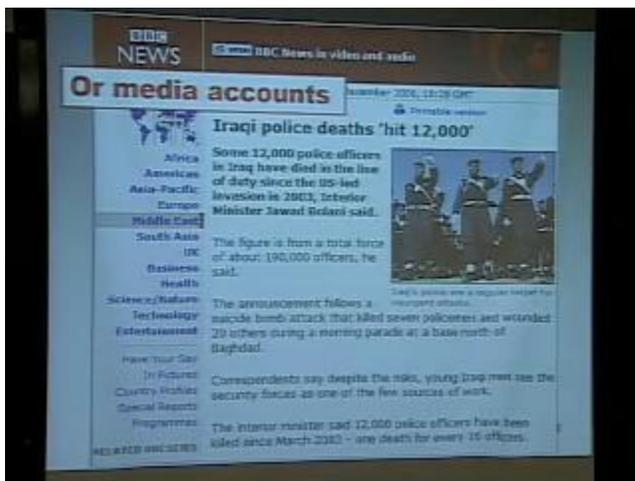
Now the question comes up right away with this famous quotation from General Franks, "We don't do body counts". And of course he's absolutely right, it has never been the purview or the responsibility of the military to count the deaths of civilians or others or even enemies in conflict. So one organization did begin very early in counting the reports of deaths as covered in the media. And they have a website, and they produce daily updates on these numbers as collected from a number of different media sources.

[5:15--Estimating death in Iraq has been by counting bodies]



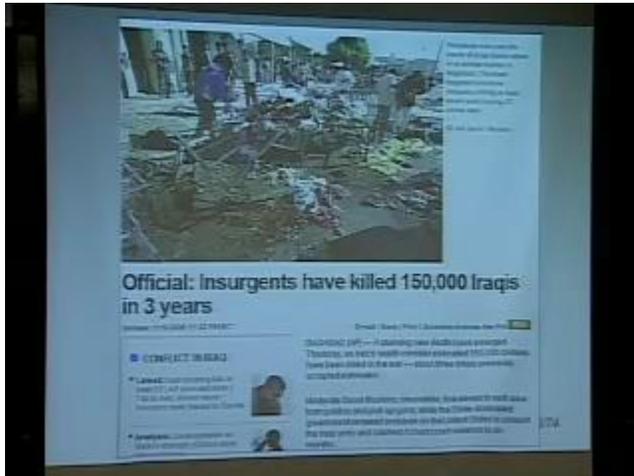
But by and large, everything that we know about numbers of deaths in Iraq generally comes from counting the dead. Whether it's counting the American forces or Coalition forces, whether it's counting Iraqis or others, it comes from basically counting bodies.

[5:34-BBC News webpage]



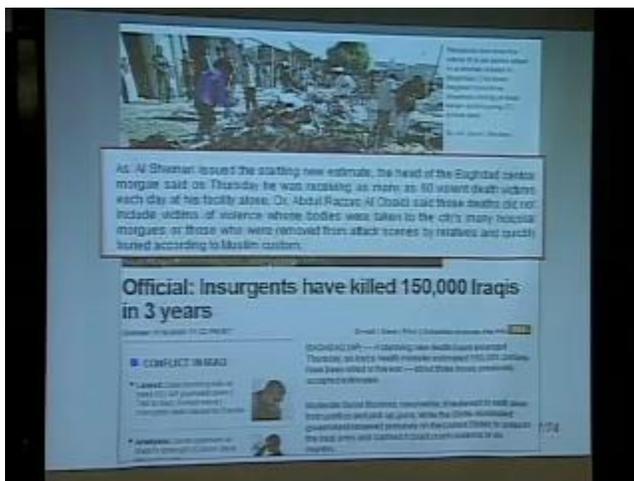
And, as a result, we have a number of different figures and fact circulating around. Here we have something from the BBC that says the deaths among police has reached 12,000.

[5:48-Different webpage about Iraqi deaths]



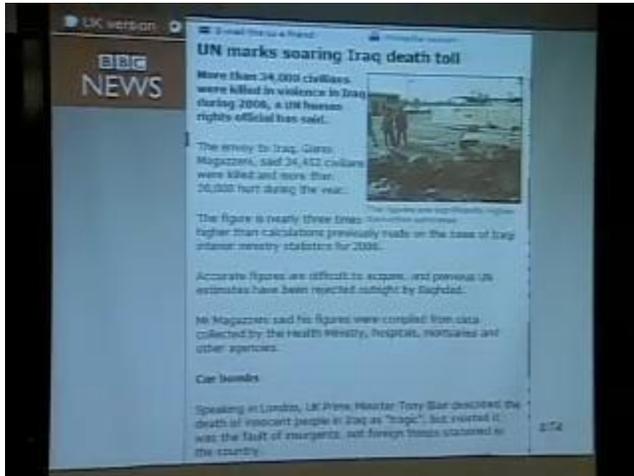
Then we have an official statement saying that were 150,000 Iraqis killed in three years. This was later qualified to say that 150,000 Shi'ites, but that part didn't make so much news.

[6:05-Pull quote from previous page]



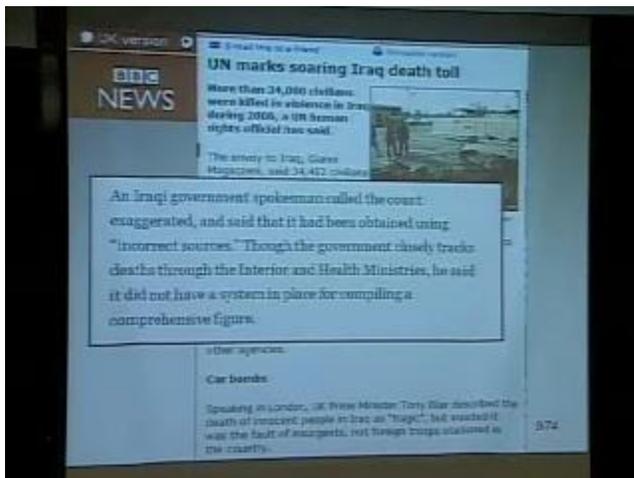
One of the quotations came out of this saying that the "morgue was receiving as many as 60 violent victims each day at his facility alone". And this "did not include victims of violence whose bodies were taken to the city's many hospital morgues or those who were removed". So we've got a little problem when we try to account for the size of a conflict just with the number of bodies.

[6:32-BBC report on UN report]



This was the UN report of 34,000 here recently.

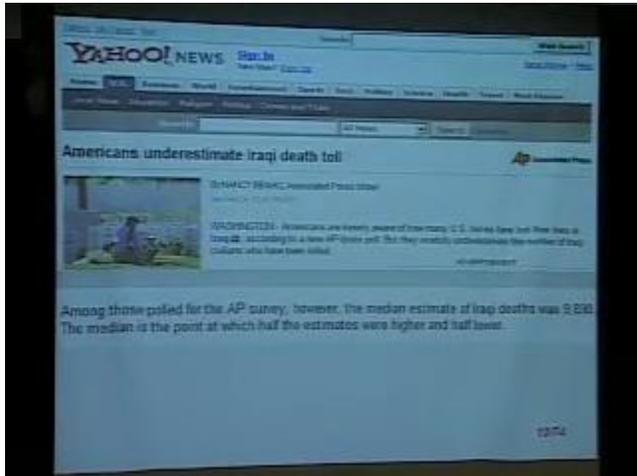
[6:35-Pull quote from UN report]



The Ministry of Health responded by saying the count was exaggerated and obtained using incorrect sources, and although the government closely tracks deaths through the Interior and Health Ministries, he said it does not have a system in place for compiling a comprehensive figure.

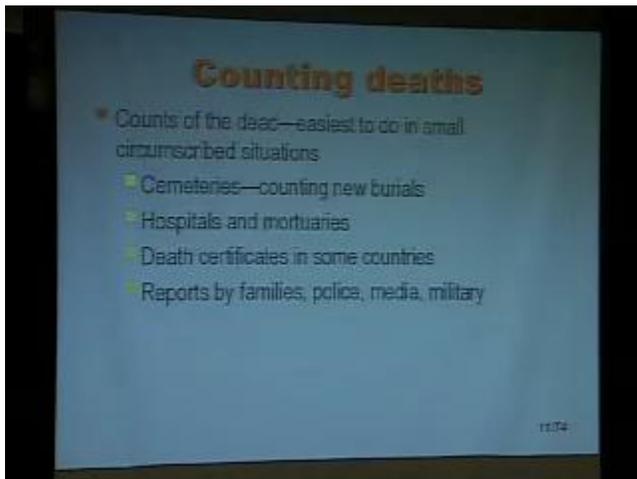
Now this is not surprising to us that work in health systems because one of the first casualties in any kind of collapse of governance or any kind of conflict situation is the information system. This falls apart very quickly, and in fact, very few countries have had the level of sophistication of the vital registration and health systems that Iraq had in the past. So it's not surprising that this was one of the early casualties of the conflict.

[7:30-Yahoo!]



And this was something that just came up the other day. Americans were polled on how many civilians were killed, and the estimate was some place around 9,000. Although the Americans were very good at pinpointing the number of American or Coalition forces killed, they weren't accurate on how many civilians.

[7:43-Counting deaths]



So, how do we count deaths. There's a number of approaches for this that we could look at. There are things such as, in a small situation, going to cemeteries, counting the number of new graves. This was done very extensively when the Kurds fled to northern Iraq and that's how we got our numbers: looking at the cemeteries, and that works in smaller situations.

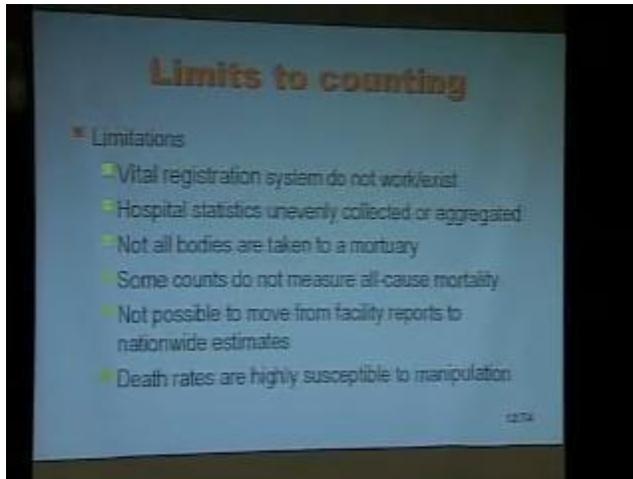
Hospitals and mortuaries often keep very good records, but getting the records up to the next level is something that doesn't work very well in difficult situations.

Some countries--not very many--but some countries have death certificates, and if the system is working well, you can track the death certificates easily.

And then there accounts from family and military and so forth.

So this is the usual way that we collect information on deaths, but these only work in fairly small situations.

[8:44-Limits to counting]



Now there are several limitations to counting. Vital registration systems usually don't exist. We take it for granted that in a country like the US we have death certificates and so on, but it was less than 50 years ago that the last American states started instituting death certificates. So it's a fairly new situation, there's not very many countries outside of the most developed countries that have this kind of system.

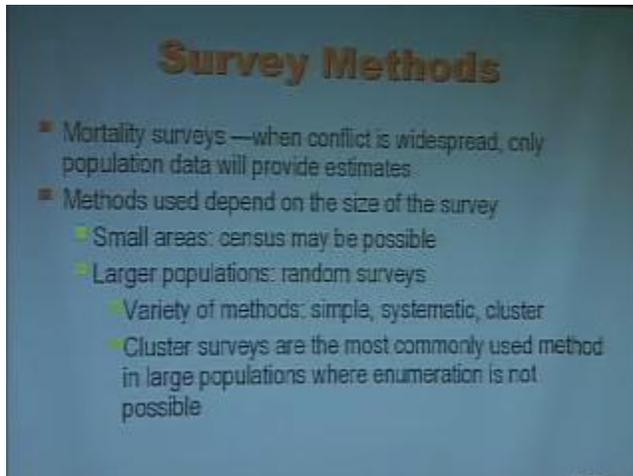
Hospital statistics, which I work with a lot, these are prone to enormous difficulties. We've been very active in putting together or monitoring the health system in Afghanistan, and getting the information system to function even in the peaceful areas of Afghanistan has been a huge challenge.

Not all bodies are taken to the mortuary; that's a well known situation, counts are only looking for violent deaths, some counts are looking for adults and not children, but if you're in public health you want to look at causes of death from a variety of reasons.

So we're looking for what we call "crude mortality", or "all-cause mortality". Many of the figures we see about Iraq don't include those as well. Now the big hitch in all of this is that you can't take numbers from the mortuaries and hospitals and so forth and make those into national figures. That, from a public health standpoint or an operational standpoint, is just not possible, you just can't move from one to another. So if you want to look at bigger estimates for an area, you have to move to a different approach to things.

And finally, as we've seen already, when you have numbers they're highly susceptible to manipulation. One of the things that came out of this study almost immediately after we released the study in October, was the Prime Ministers office in Baghdad said, "no more data on deaths except data that are released by the Prime Minister's office". So, that just emphasizes this point, down here.

[10:47-Survey Methods]



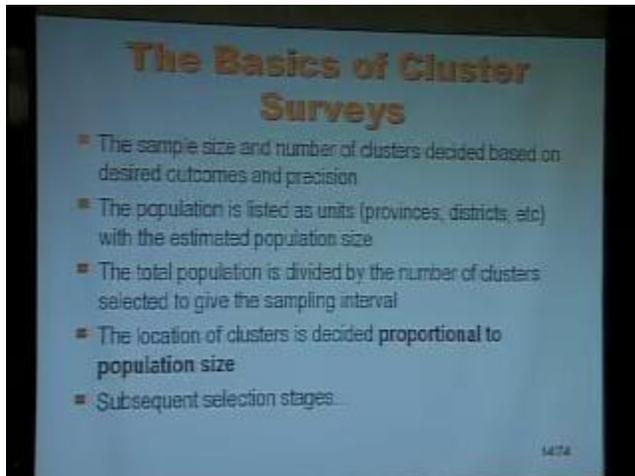
So, if we're going to try to look at evidence of death on a much larger scale than what we can just count in cemeteries and so forth, then we have to turn to survey methods. And this is the backbone of much of public health; when you read about how many people are overweight or how many people have high blood pressure and so forth, these are all based on surveys, these are all based on samples in various ways. So, in public health we're used to doing sampling methods on a regular basis. So we have a number of different ways that we could sample.

If it's a small area we could count everybody who is in this area, and then randomly we could select a certain number of people to go to, something we can't do when we're looking at a national approach to things. We could take every tenth household, but then we'd need some way to know where we turn left and where we turn right, and so forth, and that's okay if you're in a refugee camp, but not okay if you're in a bigger situation.

So as a result, we use what are known as cluster surveys. And the way a cluster survey works is, you pick out a number of clusters--and there're a number of ways you can decide this, which we'll talk about in a minute--and you go to this cluster, you find some place to start, and at that start point, you measure a certain number of people, a certain number of households, a certain number of villages, whatever. And, using the information from those clusters, then you can apply that information to a larger population.

And that's what's commonly done; most of the data that you read about for immunization coverage in Kenya, or the number of people who've had fever in the last two weeks in Cambodia, it's all based on this cluster survey method, something that we've become comfortable using over the years and is probably the most widely used survey method internationally in public health.

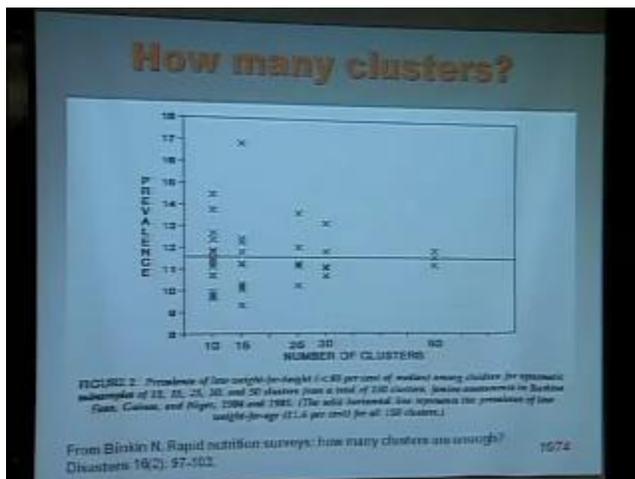
[12:48-Basics of Cluster Surveys]



So, we have to decide a number a number things: how many clusters--which we'll talk about in a minute, what's our sample size--how many people do we have to measure. An interesting thing from statistics is that the number you have to measure is really not dependent on the overall population, but what you're trying to show; what are the differences, what is the precision that you want to demonstrate.

In the population is listed, the population is divided by the number of clusters, and one of the principles that we always follow in sampling is we sample proportional to the population size. This is kind of epidemiology 101, so everybody has an equal chance of being included. So that's one of the premises that we always try to follow.

[13:34-How many clusters?]

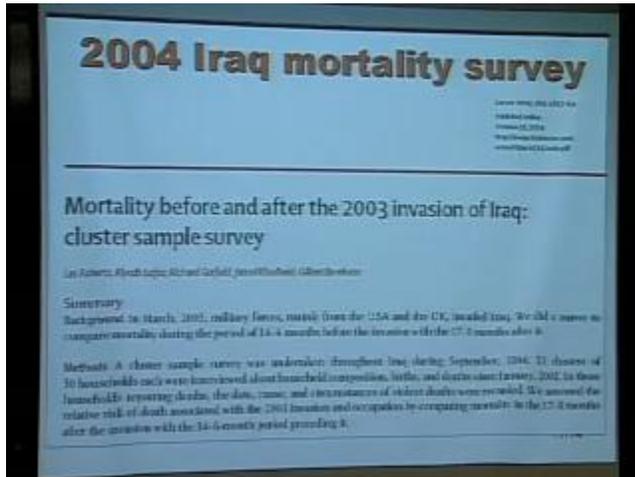


So how many clusters, I don't want to spend a lot of time with this, but we know that as we increase the number of clusters, the precision improves, so the confidence intervals narrow. This comes from a study of nutrition status in west Africa, where there were 150 clusters and they randomly selected various number of clusters, and when they got out to 60 they found they had very good precision but they found that 30 was enough for decision-making.

One of the differences that we always argue about with clinical medicine is that in public

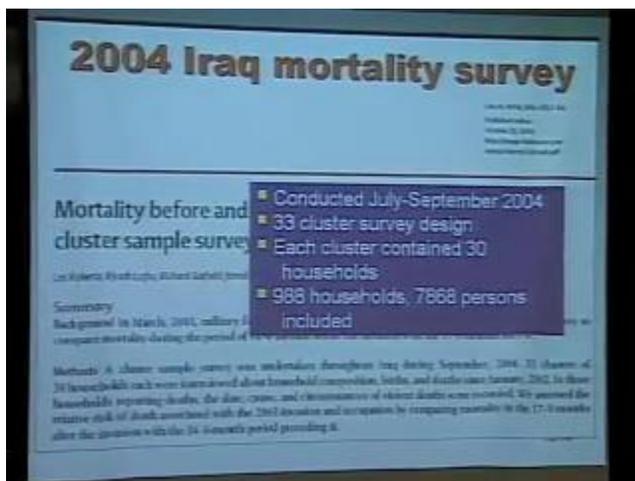
health we're never going to know the true answer. That's just not knowable when we're talking about large populations. But we have to be able to measure things accurately enough and precisely enough to make the right decisions even though we're not going to have the absolute final, true number to three or four decimal points. When you're doing clinical trials of a new medicine that's a problem; in public health we accept that as part of the way we have to do business.

[14:40-Iraq mortality survey]



This is our 2004 survey, which was published in the Lancet. Les Roberts was the primary author; he actually went to Iraq to work with Riyadh on this. Les spent most of his time hiding out in the basement of the hotel, because it was too dangerous to go out. Finally he got out on forged UN Papers, so this time our colleagues said, "please don't even think about going to Iraq, because not only is it going to be a danger to you, but it's going to be a danger to us to have you around." So we did our work with them just across the border in Jordan with this.

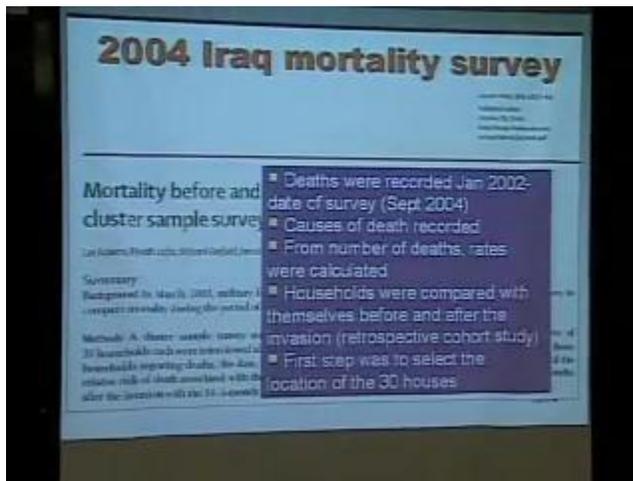
[15:19-Pull stats on previous slide]



But in our 2004 survey, we had 33 clusters. Those were 33 different locations which we allocated by random again according to the estimates of population size and distribution. Each cluster contained 30 households; in all we had 988 households and 7800 people in the

survey.

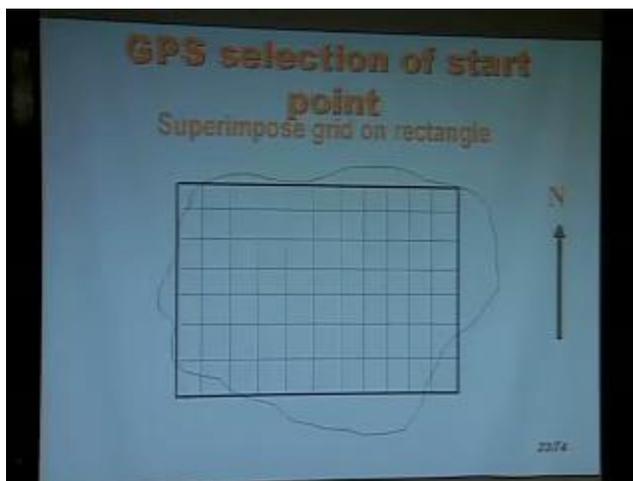
[15:47-Stats change]



We started recording in January 2002. We didn't ask people, "did the death occur before the invasion or after the invasion", we just said, "when did it occur?", and then in the analysis we looked at which came before and which came after the invasion. We recorded the causes of death, and from the number of deaths we calculated rates. So for all the people we had as the denominator and the number deaths were there as the numerator, and then we calculated according to various causes.

And we did this in what is known as a "cohort" or "retrospective cohort" study, so we compared households with themselves. We said, "what was this household like in the period of time before the invasion, and what happened afterwards?". So we were comparing people against themselves, for the households. And the first step was to select where these 30 households were in each cluster.

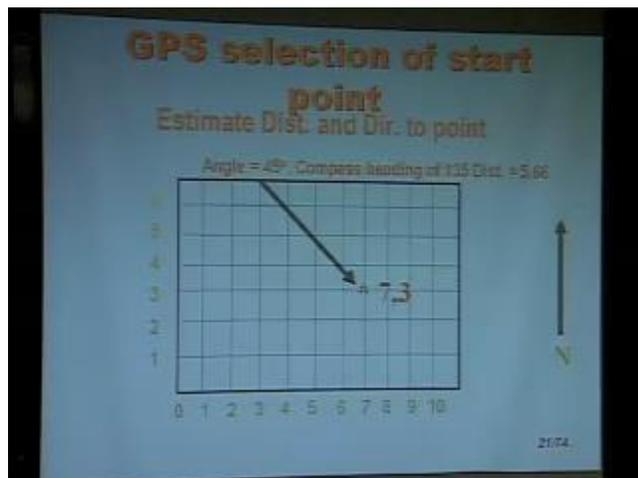
[16:46-GPS selection of start point]



hbb

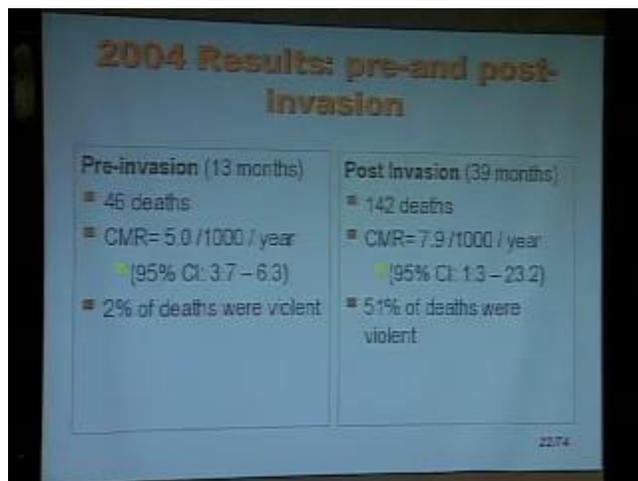
So this one we did back in 2004 using GPS. So we would go around in a village or community or neighborhood with a GPS unit, and using that we would calculate an imaginary grid--

[16:58-Estimate dist. and dir. to a point]



--100 meters apart from each other, and then we would randomly select a site, we would use the GPS unit to go to that site, and that would be the first house we would do, and then 29 households in addition to that, contiguous with each other, we would then visit, and get our data in that direction.

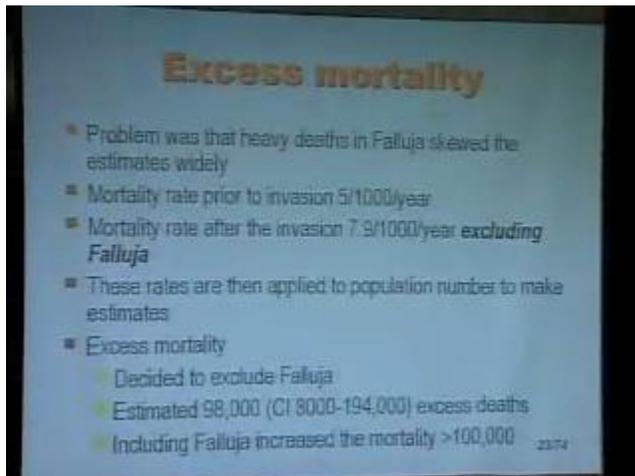
[17:16-2004 results]



And in that time we found 46 deaths before the invasion, 142 after the invasion. We calculated a crude mortality rate before the invasion of 5.0, and afterwards of 7.9. Now, one of the big differences was the number of deaths due to violence. Our definition of violence wasn't car crashes or roof falling in on the house, but these would be intentional violence, like gunshots and missiles and so forth.

And there were a few deaths from violence before the invasion, and these were probably-- there weren't many, just a couple--these were associated probably with the no-fly zones and the process of radar units locking on to airplanes and then firing back at the artillery and missile sites and so forth. But after the invasion, half of the deaths we found were due to violent causes.

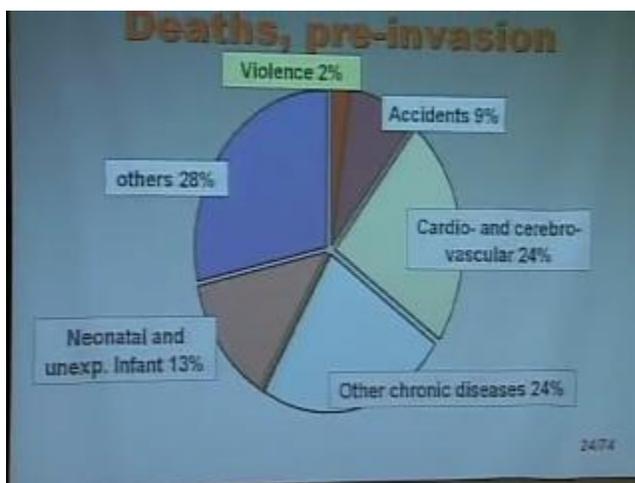
[18:24-Excess mortality]



Now, in this survey we had a bit of a problem; a serious methodological problem, and that is one of the clusters we randomly chose was Falluja, and this was in July and September of 2004, before the big strikes on Falluja in November. However, there was so much death in Falluja that it skewed things really badly. So in the end, we decided in our analysis to leave Falluja out, and I'll show you what that would do to calculations in a minute. But, excluding Falluja, at that point, we estimated, applying the rates to the overall population of Iraq, that were 98,000 excess deaths. So this means death that occurred beyond what would normally occur. Under normal circumstances (no conflict in Iraq), we could probably expect around 150,000 deaths per year, from old age, from cancer, from heart disease, and so forth.

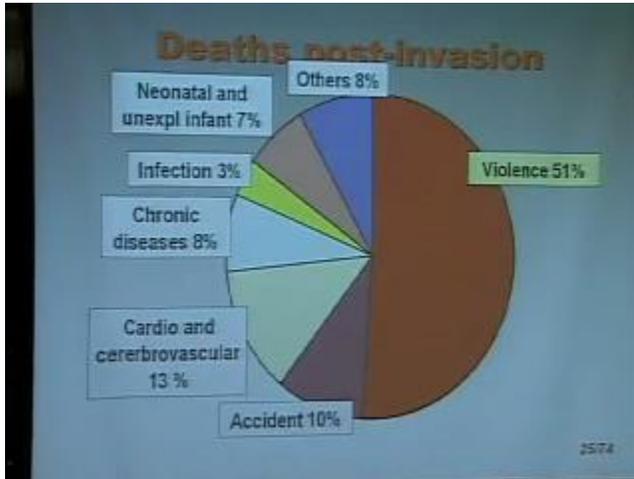
Well these are deaths above that. We got a huge amount of criticism for these confidence intervals, and I'll come to these confidence intervals in just a bit, but we had a confidence interval at the low end of 8,000 and at the high end of 194,000.

[19:40-Deaths pre-invasion]



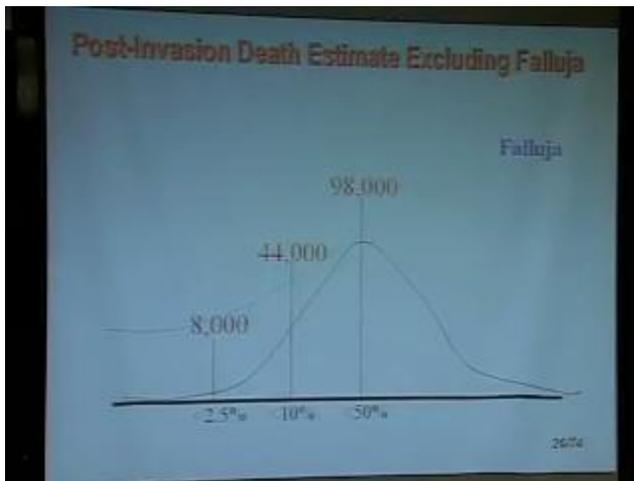
These were the deaths pre-invasion, 2% were due to violence.

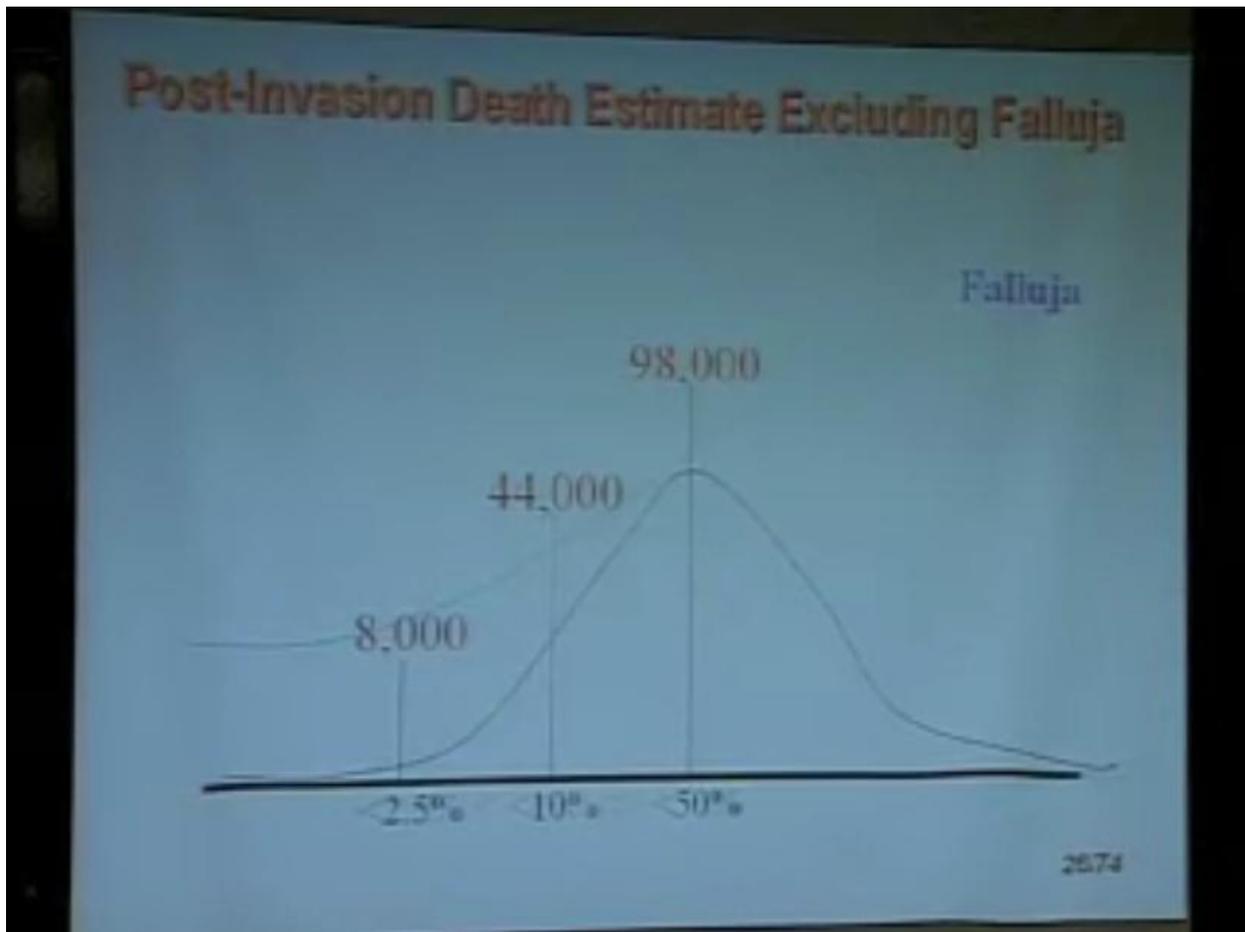
[19:43-Deaths, post-invasion]



And post-invasion, 51%.

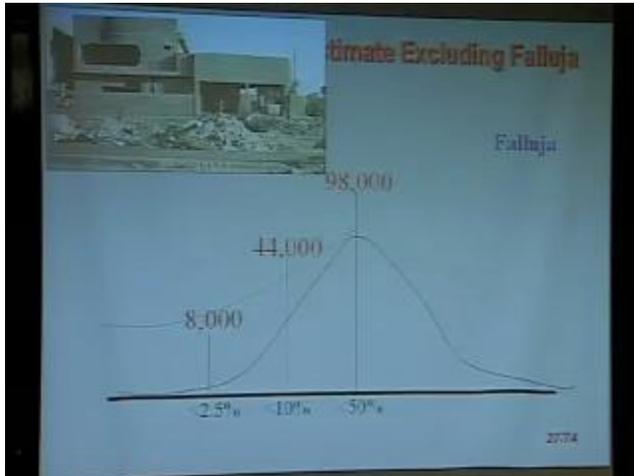
[19:49-PI death est. excl. Falluja]





Now, this is what the confidence intervals would look like; there is a 10% probability that it was less than 44,000 and only a 2.5% chance that it was less than 8,000. If we put Falluja into it, the top end of the confidence interval would be infinity! It really skewed things so badly that we decided we would just leave it out and be concerned with just even this.

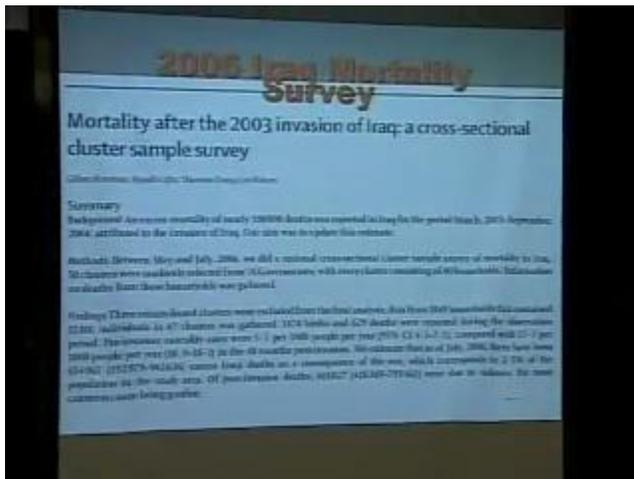
[20:17-Previous slide plus picture]



As I mentioned, we got a lot of criticism for even this. This is one of the pictures snapped in Falluja, showing widespread destruction. I might add that in the second survey, I intentionally asked a team to oversample in Falluja, to take three samples. If they chose Falluja in the random selection, which indeed happened, so we had three samples, three clusters instead of one, which the population would have merited, and then we randomly selected one of the three which turned out to be the one that had the lowest mortality in the three clusters.

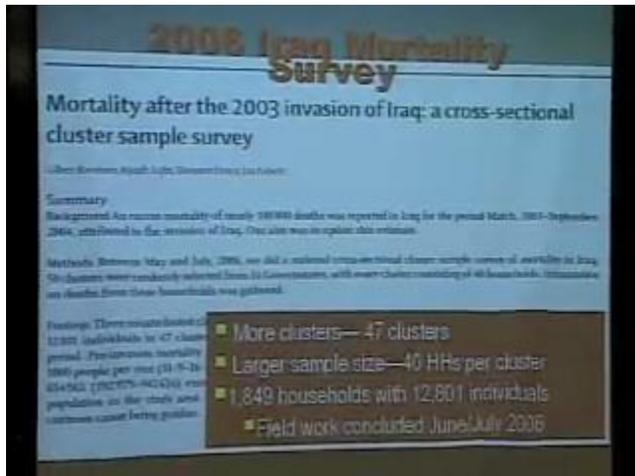
But the experience in the first one was really true to what we found and in the subsequent one there was very very widespread destruction in Falluja. Nearly every household had lost somebody in that survey.

[21:13-2006 survey]



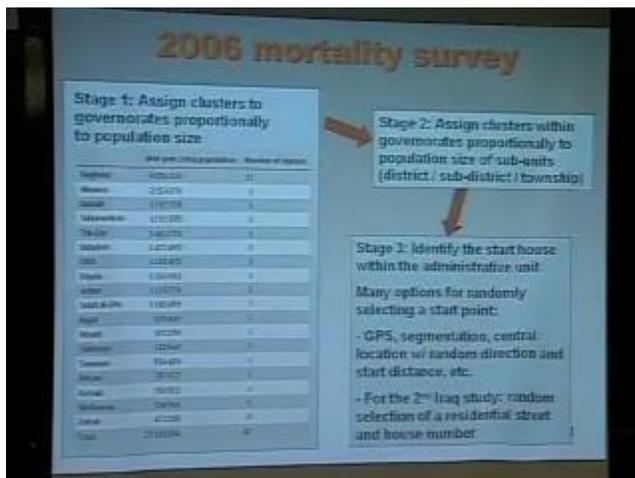
In 2006, we went back to look at things again from May to July of 2006, and as John knows, we had a great intention to get this out as early as we could, before the elections, so we would not be again accused of trying to do something with the election, but one thing and another, movement of money, ethical approvals and so forth, we didn't get it done quite as soon as we would've liked.

[21:37-Previous with pull stats]



But in this one, we did more clusters. We did 47 clusters this time. We had a larger sample size, and we spent a huge amount of time dissecting the previous data to figure out what's the ideal size to have in a cluster. Some people were pumping for 45 but we ended up with 40 in a cluster. And in this one we had 12,000 individuals instead of 9,000, and we had 1800 households, as as I say we finished this at the end of July.

[22:12-Mortality survey]

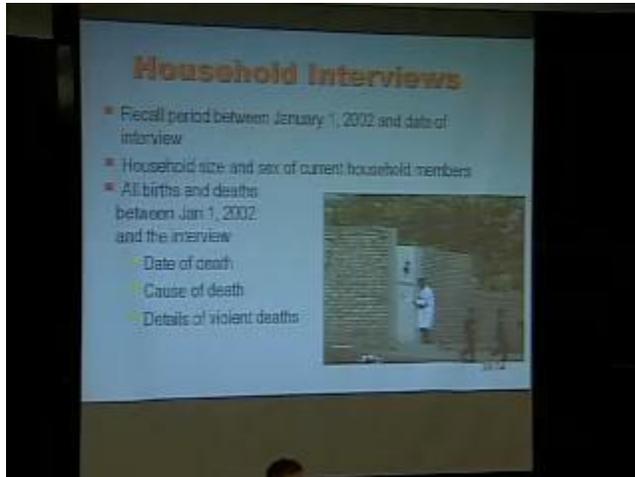


This is how it actually worked out: Baghdad, which has about a quarter of the population or slightly more, got twelve clusters. And then it went down according to populations. Now, the last two probably should have been included, but because of some mix-ups in communication, they did not get sampled.

The second stage was to assign the clusters within the governorates proportionate to their size, and the third was to identify the start house, which is the house you want to start at. We had multiple options. One of the things we were thinking very much about was using GPS units again. But our surveyors said: "No, not this time. If you go out with this thing in your hand, people are going to think either that it's a remote detonator or that you're going to call in some kind of airstrike. And in either case, no matter what they're thinking, your life expectancy is about 45 seconds at that point.

So we said okay, we have to do something different. There are several other approaches, but decided to look at random selections of the streets, and I'll show you how to do that in a moment.

[23:18-Household Interviews]

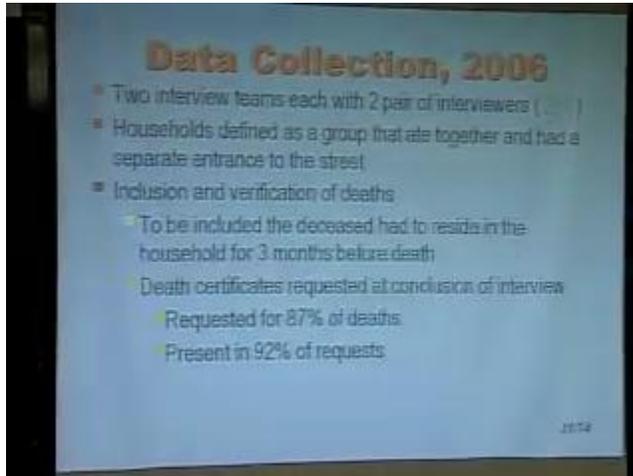


Here's one of our team, and we had an interesting approach to sampling. The team were all doctors from the community medicine department in Baghdad, and they went out, house to house, in their white coats, so they couldn't be mistaken for being somebody else. They first rounded up the children, explained them what the survey was about, sent them off to the households to explain to the neighbors what was going on, and so forth; to try to reduce the risks that were involved.

Ideally, if we were trying to reduce the effects that clustering had--statistically, cluster surveys have a problem, and that is that houses that are very close to each other tend to be very similar to each other. So, if you were to do this ideally, you'd say, "I'm going to do this house, then I'm going to skip two or three houses, then I'm going to do the next house", gives you a bit more spread, helps to reduce the effects of clustering.

Well, we felt if we did that, it would increase the risk for the interviewers as well. And as some of you might know, interviewers have died in the process of doing surveys in Iraq, so this is not something to be taken lightly. So we kept them fairly compact, and we're happy to say there were no deaths or injuries to our survey team, although there were some scary, scary times along the way.

[24:44-Data Collection, 2006]



So we had pairs, male and female. Generally speaking, women will speak to women, so if the head of the household is home or the person in the next home is a woman, the woman would often go to the next house and get started there. So with these two pairs of interviewers for each of the clusters of 40 households we were able to finish a cluster in a day.

One of the things we didn't want to do is come back the next day. With many surveys, you'd have no problem coming back; in fact you'd want to do that, you'd want to check up on some percent to make sure you got the accurate information. But in this case we decided it was too risky to do that.

In order to be counted as a death in that household, you had to be living for three months in that household, so that reduced the chance of people just passing through getting included. Back in 2004, we asked for death certificates in a few households, for fear that asking to see death certificates may be seen as doubting people and so forth. But households were very agreeable to this in 2004. So this time, our intent was to ask every household with a death for a death certificate. Now, if you've ever done survey work you know that you don't always get all the answers that you want, and in this case, in 13% of cases, the interviewers forgot to ask for a death certificate. But once they did ask, 92% of households had the death certificate, which says a lot of things about the vital registration system, the importance of death certificates, in Iraq and in the past.

[26:31-Google Earth picture]



So this is how we did this kind of thing, this is a Google Earth picture. So if we collected a neighborhood like this:



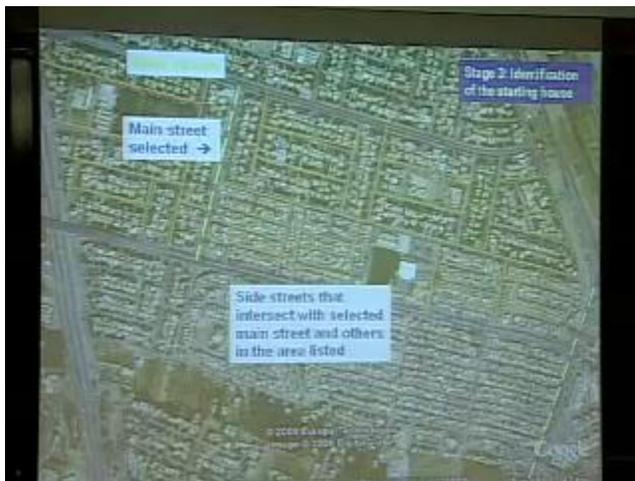
Then what we would do would be to list the main streets:



We would select one of the main streets at random:



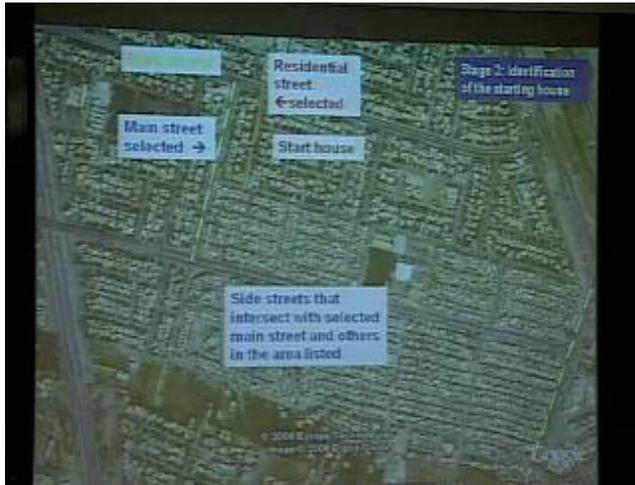
And then we would list all the residential streets that either crossed it or were in that immediate area:



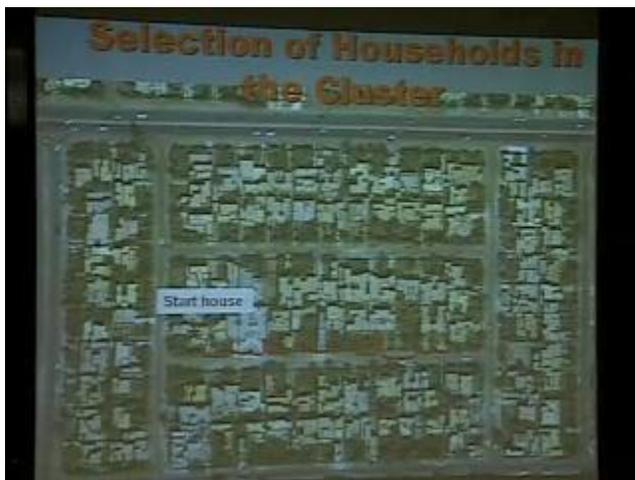
And then we randomly selected one of these side streets to survey:



Then we numbered the houses on that side street, and then we randomly selected one of those to start:



[27:05-Selection of households in the cluster]



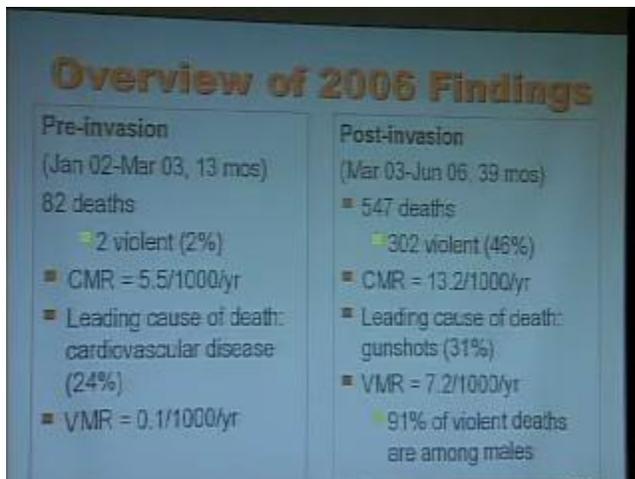
Once we had the start house, we went door to door until we got the forty nearest households.

[27:17-Next neighborhood picture]



So if we looked at things, we would have said, "in this cluster, this is the area that we sampled". Again you can see that there is this kind of problem with clustering, that houses near each other have a kind of similarity, but in the analysis you account for this type of effect.

[27:28-Overview of 2006 Findings]



So these were our findings, and we went back to that same period of time, January 2002, because we wanted to have a check on our previous data. One of the problems with this kind of survey is what we call "recall bias". People may forget things, but in the case of death, you usually don't forget them. But, you may not remember exactly when they occurred. Maybe it was December, but it was actually January, or you're a month or two off.

So we wanted to go back on what we found previously. So what we found in the households that we randomly selected was that, and we went back to completely different clusters. Some of the clusters were in the same town, but in the random selection process we never actually selected the same neighborhood or the same village as we did before. 11 of the

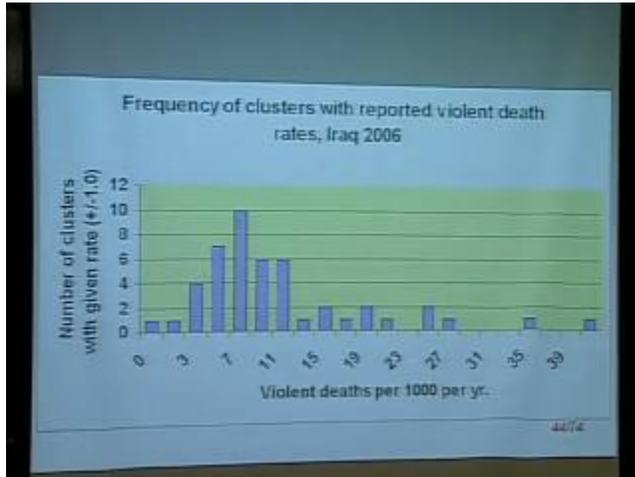
clusters in the second survey were in the same geographic area as the 33 clusters from the original survey, but they weren't in the same specific areas.

We found a crude mortality rate of the 5.5, so that's close to the 5.0 that we found the first time, and over the period of time in the three years after the invasion we found a crude mortality rate had risen to 13.2 per thousand per year, so more than doubling the mortality rate. We had calculated our sample size to be more than adequate to measure a doubling of the crude mortality rate. So we met that.

The leading cause of death we found were gunshot wounds, and there were a lot more recently of deaths from car bombs, but still in July and August of 2006 gunshot wounds were the major cause of death.

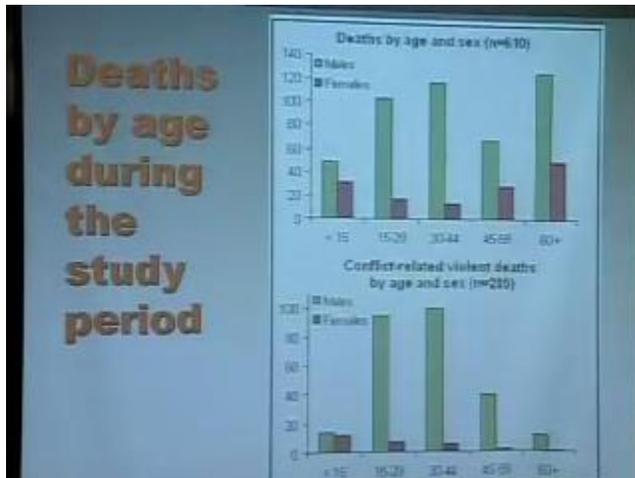
Then we calculated a violent mortality rate. This is a cause-specific mortality rate of 7.2 per thousand per year. 91% of these violent deaths were among males, and I'll come back to this in a minute.

[29:42-Frequency of clusters with reported violent death rates, Iraq 2006]



One of the things we always want to look at is how are our data distributed; are they skewed particularly in one direction or another. So these are the number of violent deaths per thousand per year, and these are number of clusters in the Y-axis here. As you can see, there is a normal distribution at the far end, and I think this is Falluja on the lower end, with a very high number of violent deaths and then this is Diyala as well. So a couple with very high levels, but generally very normally distributed, but something this tells us is that violence is pretty much spread around all the sample areas and not just concentrated in a few areas. This is important when we think about how the media reports events, and what you find in surveys; there's a different type of distribution.

[30:42-Deaths age during the study period]

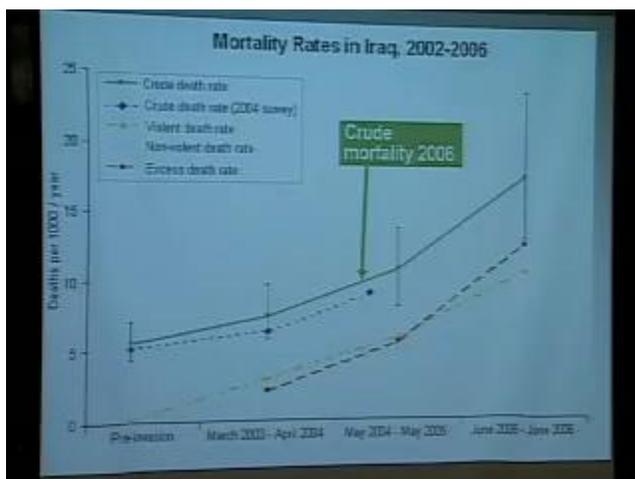


This is very interesting; if we look up here at all causes of deaths, we can see, if we concentrate on the women, we can see what the demographers would call a "J-shaped curve". This is normal; high mortality with the children, dropping off, then rising with the elderly. If we looked at this for the US or Guinea-Bissau, we'd see something very similar to this.

But what's remarkable is how the number of deaths in males in the middle years far exceeds that of women; if we look down here just at violent or conflict-related deaths, you can see some deaths among females in the younger ages, likely to be school children, people out in the streets, and so forth. But in women, having the ability to hunker down, to stay out of danger's way, obviously is a protective mechanism. But for males, didn't work so well. So in the area of 15-45 years of age, we see the largest bulk of deaths.

Now, are these people involved in combat? Could be. Are these people just coming and going from their job as a barber or butcher or something? Could be as well. That's one of the problems with survey data: you can't always dissect out what the circumstances were.

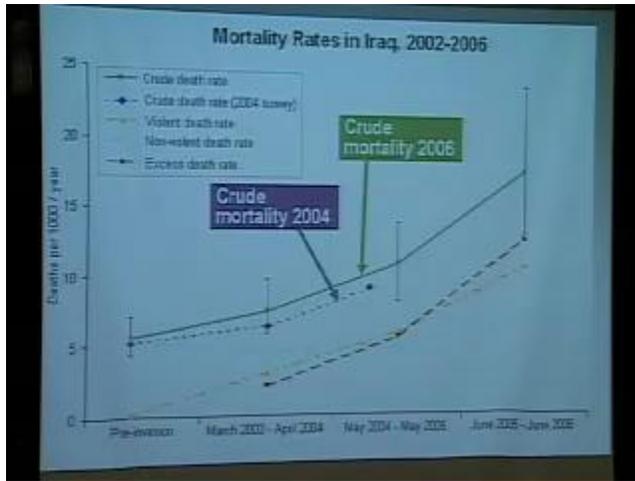
[32:04-Mortality rates in Iraq, 02-06]



Okay so here's kind of the busy stuff on the charts. So if we look at the mortality rates, starting here with pre-invasion, and we analyze these in kind of thirteen month intervals,

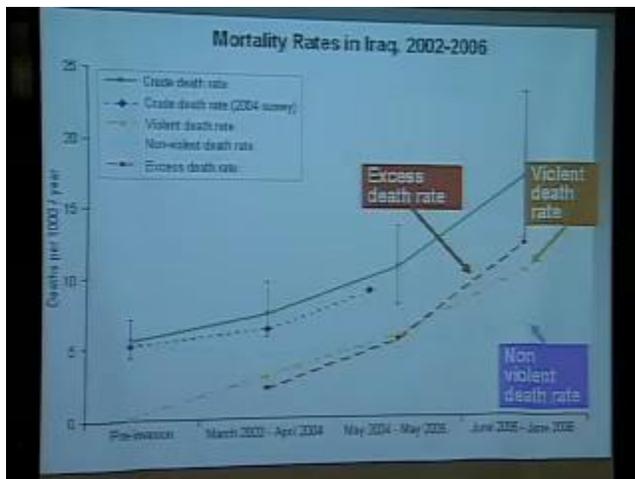
we can see the the overall or crude mortality rate rising to some place like 17 deaths per thousand per year, here at the end of the analysis period.

[32:23-Previous slide plus arrows]



We took our data for the same period of time as 2004, and then we analyzed it, and we get a picture like this. So you can see these track very closely with each other. All these are two independent data sets taken from different locations, the results parallel themselves very closely.

[32:42-Previous slide with new arrows]

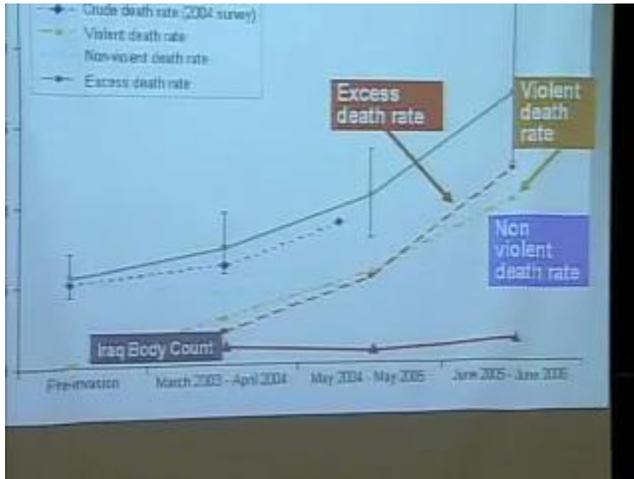


Then we looked at excess death rates; these would be above the baseline figure of 5.5, and you can see these rapidly increased. We looked at violent deaths, these rapidly increased as well, and you can see that the difference in these lines is not too great, suggesting that almost all of the excess mortality is due to violence.

The thing we were surprised about was the fact that non-violent deaths had not increased. In fact, that's what we really expected, because in conflict situations, people lack access to health services; they can't get their insulin, can't go to get their babies to the hospital, so we see a rise in that. We also see situations where there's no electricity, no water; a lot of public health issues. So non-violent deaths rise as a consequence, and that's what we

expected to see. We were very surprised to see that it actually dropped a bit here, and only in the last year did it rise, and in the last year, that rise is not statistically significant. It might be part of a trend, and there's reason to think, with health systems deteriorating and so forth, we're going to see a rise in non-violent deaths. If we look at this again in a year or two, we might see this as a significant number.

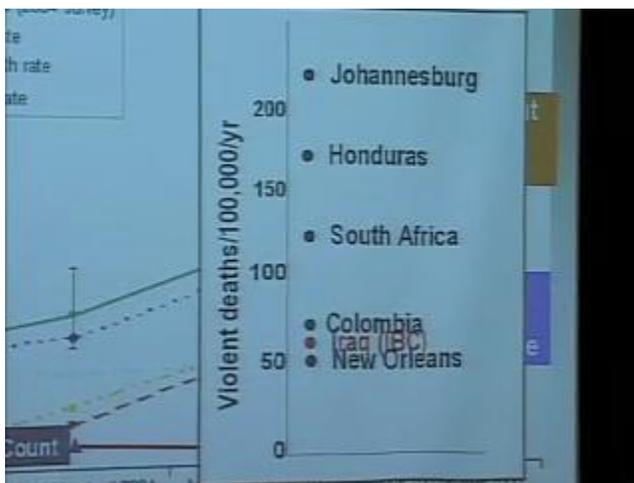
[34:14-Comparison with body count]



These are number from people who count bodies in the media; the body count. And it might be interesting to note that when we found an increase in the rates of deaths, the body count found a fairly flat graph. However, it's important to note that they're not measuring all-cause mortality, they're measuring violent deaths.

But to put this into picture, if we were to convert this to deaths per 100,000 per year from violent causes, which is the usual way this is reported in international literature, we'd be here at around 54.

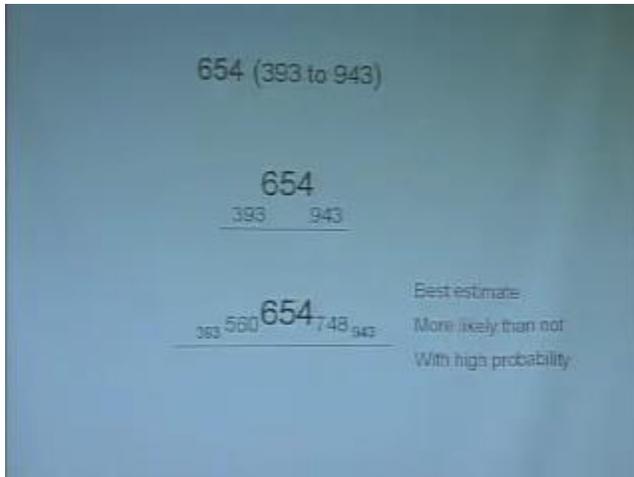
[34:59-Comparison with body count plus everything else]



To put this in to context, this is New Orleans, not far behind, Colombia, South Africa, Honduras, and Johannesburg, about the highest one that I found, although there are parts of Johannesburg that are off the chart. Here's where Boston is on this, so you're safely at

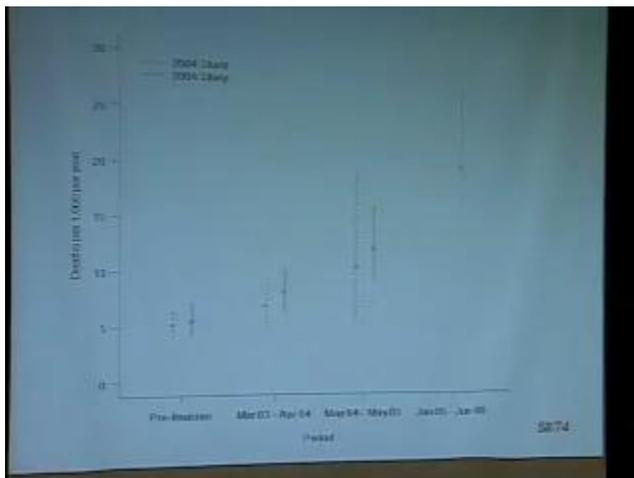
chances are we would see something that looked like this. So so the chance of it being less than 500,000 is about 10%. So this gives a picture of things.

[37:00-Examples of confidence interval reporting]



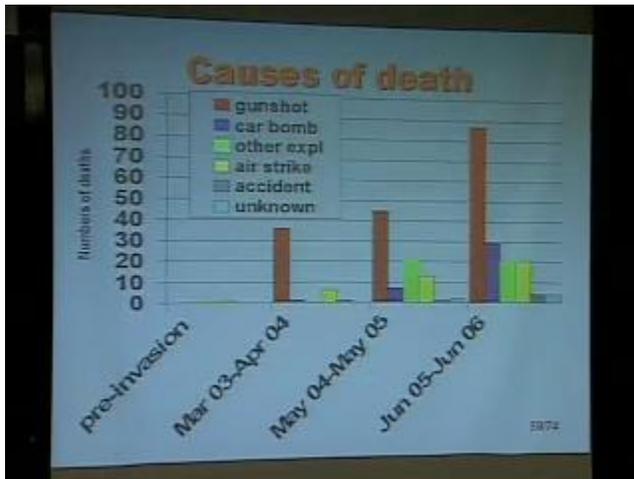
We have a problem with reporting confidence intervals, so a number of my colleagues have been thinking of other ways to report confidence intervals. This is what the Chair of our statistics department thinks: if we report it like this, maybe that's traditionally how we do it, but if we report it like this, or maybe we should report it like this, and maybe we should put things like "this is the best estimate", and "this is more likely than not", and "this is the range for which there is a high probability". We're still playing with that kind of thing.

[37:15-Graph of correlation between the two surveys]



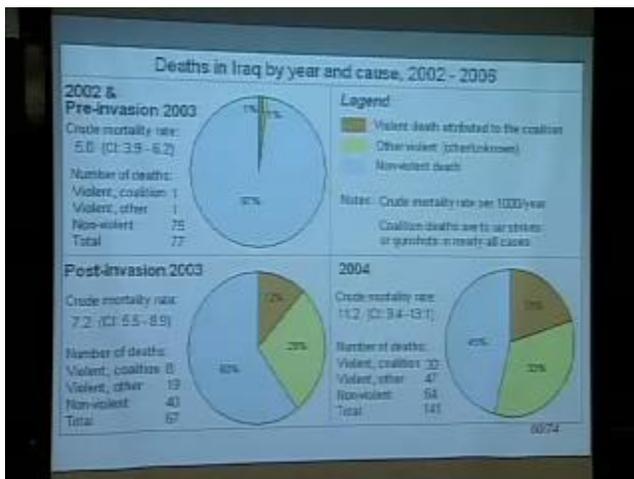
However I wanted to show this graph for statistically minded people to show the comparison of the two surveys we did at independent locations. These are the confidence intervals around them. So as you can see, they pretty closely track each other.

[37:31-Causes of death]



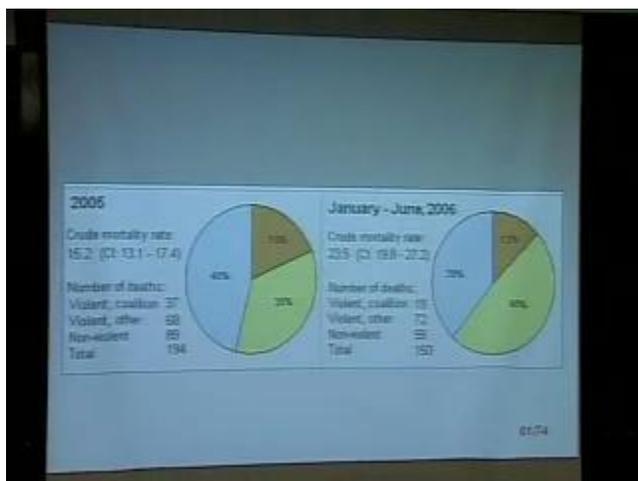
Okay, causes of death. Gunshots, as I said, were a major cause; airstrikes, throughout the time; car bombs, which are the blue ones, which you can see are becoming more common, but still much less than we would see from gunshot wounds, which are so common. So gunshot wounds are less than car bombs, and that's what we see in the media.

[37:51-Deaths in Iraq by year and cause, 02-05]



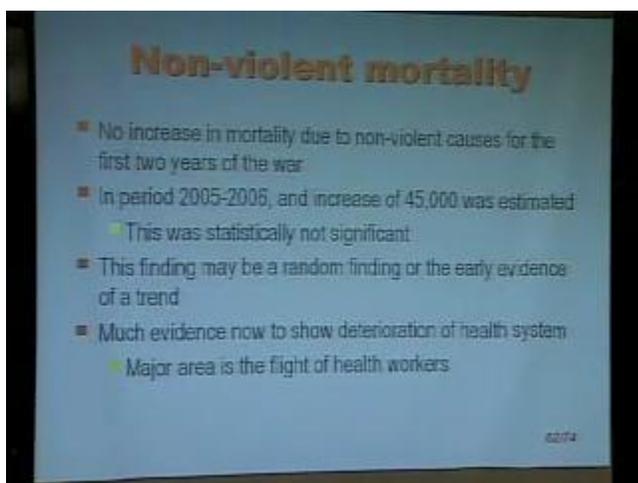
Now, this is what people told us. In the previous survey we try to find out how many deaths were described as being due to violence, or criminal activity. This time, people couldn't tell. Since so many deaths, as you can see why 2004, 33% of people said they didn't even know, or they might have meant they didn't want to say, either way. And there's a lot of sensitivity in these situations, really doing much probing in this area. So, we were very conservative with a probing, didn't do as much as we should.

[38:29-Deaths in Iraq by year and cause, 02-05 cont'd]



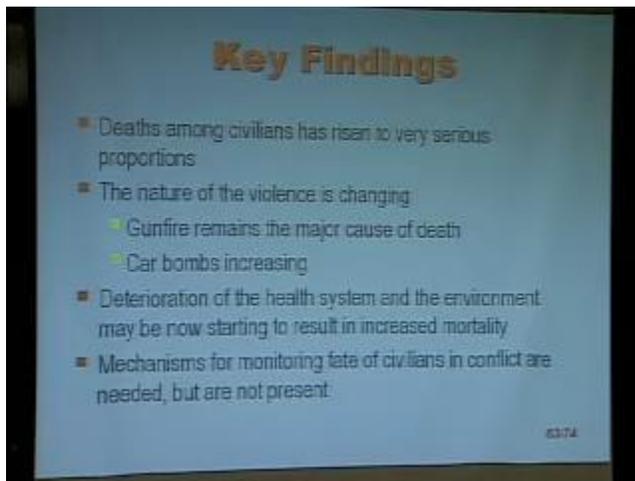
This is the part, that was ascribed to the coalition; the numbers dropped, the percentage dropped, if we look at the actual numbers, the numbers stay the same or actually increase, there is certainly a growth in this unknown.

[38:51-Non-violent mortality]



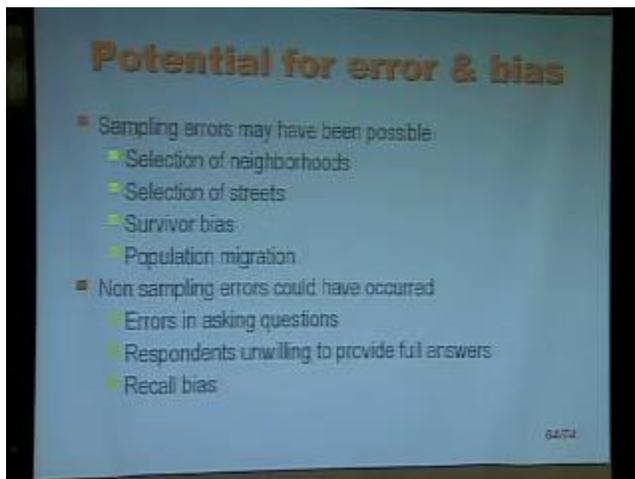
As I said before, this is the nonviolent. There's more that we need to know about this, and I don't know what it all means, and it needs to have some more probing in this.

[38:58-Key findings]



So our key findings were that the deaths among civilians had risen to very large numbers, gunfire is a major cause, deterioration of the health facilities is going on, we know that. Whether this is just a random finding that nonviolent deaths are increasing, or the first sign of a trend is coming, but it's too early to tell. Whether it's statistically significant, I don't know.

[39:24-Potential for error and bias]

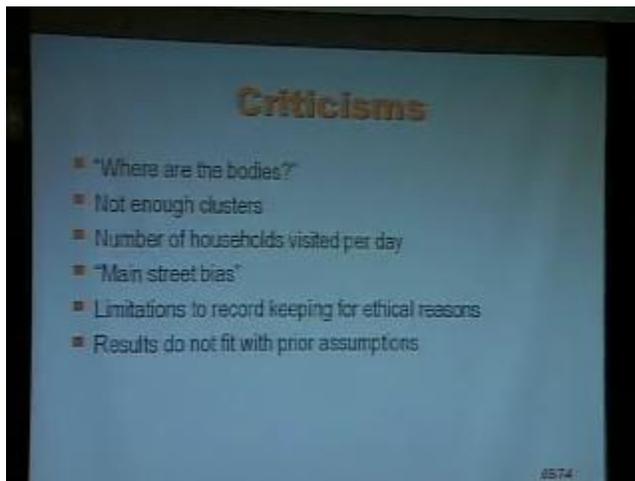


And their potential for errors. Any kind of survey has biases, people might, if you have an axe to grind, want to select a neighborhood that's more violent. Or if they're fearful for themselves, they may unconsciously want to select a neighborhood that is safer. So, with good training and supervision you try to minimize that, but it's still a risk. Selection of streets might be a risk, survivor bias is a huge issue we have to try to look at mortality. Dead people are there to report, so we don't know. But every neighborhood that we went to, we tried to ask, "are there any houses in the neighborhood where everyone has been killed from some violent event". And, in some neighborhoods there would be one household where everyone had been killed. One of the clusters we did in Falluja, there were seven households where everyone had been killed in a violent event. So this is a real issue.

In population migration, and this is something that can really skew numbers. We asked households about in migration and outmigration. And so, within the households, I think things were fairly steady. But if there is big movement within the country it changes your denominators, there's a number of issues that can complicate things there.

And then there's errors in asking questions; people may not have asked things the right way. Respondents may not have responded with all the information. They probably didn't hide deaths that have occurred, because we had death certificates to back that up. But they might not have reported deaths that actually happened. And then there's the recall bias issues and so forth.

[41:11-Criticisms]



We had a lot of criticism, naturally. One of them is, "where are the bodies?". There is still a belief that it is not possible to estimate deaths without seeing the bodies. And then I refer people to the tsunami, did we have accurate data when we couldn't find the bodies there? So that's one of the criticisms. However, there are plenty of new evidence about the necessity of making new graveyards and so forth.

There was a criticism from Paul Bremmer's (sp?) pollster, in the Wall Street Journal, that we didn't have enough clusters. Well, clusters will improve precision, so if you want smaller confidence interval, you need more clusters. If you want to keep your interviewers alive, maybe you don't want to do too many more clusters. If we wanted to compare one governorate to another governor if, we would have to do more clusters in each one of those. But we chose to do a national sample rather than try to localize in particular area.

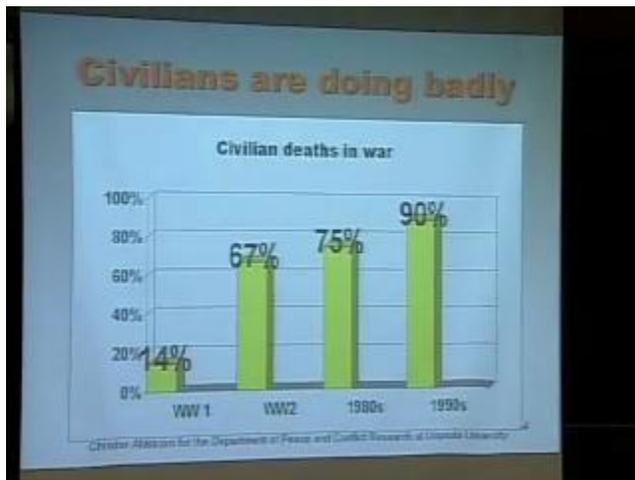
There was a criticism from a psychiatrist in the UK saying, "how could two teams of survey or his visit 40 households in a day". Well anyone who's done surveys knows that it depends on the length of your questionnaire, and the other things you do, and many of us have easily done that number.

A group of physicists in Oxford complained that are sampling method favored the principal streets, where they interpreted that most of the killings may have occurred. In fact, we went out of our way to include all the streets in our sampling frame. And of course, one of the things we found is that most killings take place away from home anyway. So that probably didn't add much the bias, if it had even existed.

There were limitations to record keeping; we had criticisms that we could not produce a record showing which houses were visited and what the names of the were, and so forth. We intentionally did not record that, because we felt that if the team was stopped at a checkpoint, of which there are lots of checkpoints, and the records were gone through, some of you may have had this experience, where you stop the checkpoint, people go through all your papers, read everything, and they find certain neighborhoods. That might have been the increased risk, which we didn't want to do.

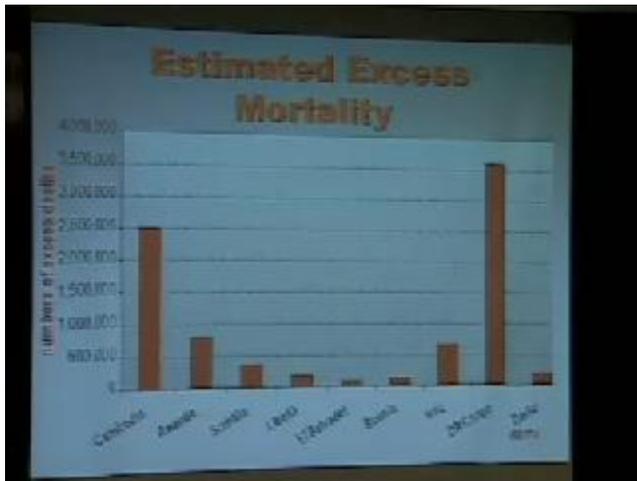
And the big problem, which applies to all of science, we have pre-existing conclusions and assumptions, and the data don't fit with them, so there is a problem with the data.

[43:41-Civilians are doing badly]



So, I just want to finish off here by saying, "what are the implications?". These are some data coming from Uppsala, looking at the civilians as a proportion of those killed in conflict. And this is widely accepted although the data is a bit thin in some cases. So clearly there are more civilians and combatants being killed.

[43:59-Excess mortality]



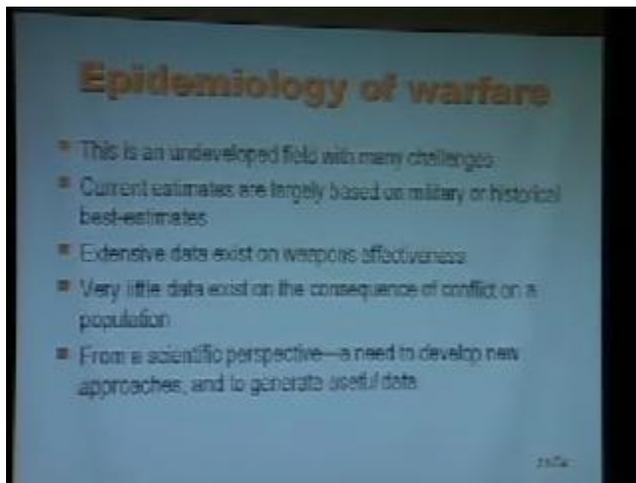
If we look at excess mortality you can see that there are a lot of situations in the world where there are a lot of excess deaths among civilians. Congo, where Les Roberts worked, is an example of huge excess mortality.

[44:11-Estimated excess mortality in some recent wars]

Rwanda 1994-93	1.0-3.1 million
Bangladesh 1971	300,000-3 mil.
Cambodia 1978-75	2-500,000
Pol Pot 1975-80	1.2-5.5 million
Ethiopia 1974-84	1-2 million
Mozambique 1975-92	600,000-1mil
Afghanistan 1979-92	1-2 million
Sudan 1983-95	1.3-2mil
Iraq-Iraq 1980-88	1million
Angola	???????????
Somalia 1981-90	4-500,000
Gulf War 1991	150-300,000
Bosnia 1992-95	100-250,000
DRC 1996-02	3.3 million

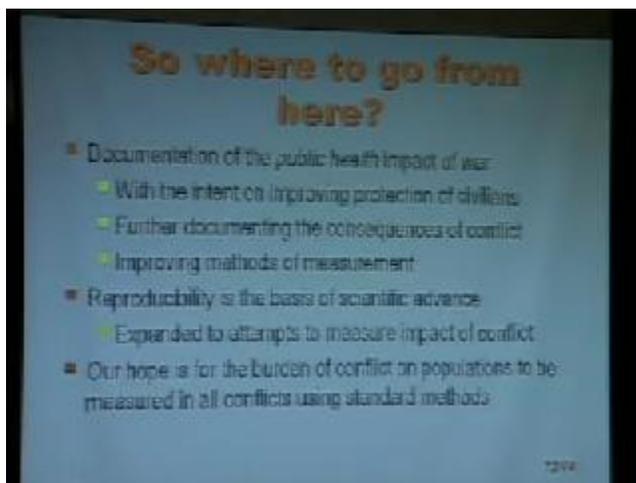
Here's some estimates of deaths in recent conflicts. And you can look at these. If you're annoyed by the idea wide confidence intervals, how about 1 to 3.1 million, or 300,000 to 3 million, or 1.3 to 2 million, or ???. This is a real problem. And if they look at these, these are the only ones where we have any good data, any solid epidemiological data. So this is an area which has just not been explored.

[44:43-Epidemiology of warfare]



This idea of epidemiology of warfare, I think is an evolving sub-discipline of public health, and I think this is an idea that we are making a start in, but people have to do more of this, find new ways and new techniques of doing this

[45:04-So where to go from here?]



So where do we go from now? From our standpoint and public health, it is how do we better document the impact of conflict on a population. Not because it's just a curiosity, we want those confidence intervals narrower and so forth, but how do we use these data to protect people, wrapped up in conflict. And this of course, is not the only conflict in the 21st century, there's going to be more, how do we collect the data, and we can use this in some way to protect populations involved, and do this in a systematic way that we can agree on and people can use for comparison.

So, that's my presentation about Iraq.

So we can open up for -- good, here's someone who is a question.

[46:00(?)] Question: All the projections from the cluster to the entire population depends

on having an accurate census. And, it seems to me that the census is incomplete, we know that people are fleeing the country, and their million people in Jordan, etc. Could you talk about it?

Answer: that's a huge issue, the census data. And this is as we ended up using were the 2004 UNDP estimates, and those came in a little bit after we started the sampling, and in our final analysis we try to trim the samples a little bit to try and match our 2004 data. When we started doing a survey in 2006, the large-scale migration out of the country was just starting. We started see some of the ethnic cleansing, if you want to call that, or sectarian cleansing going on. But it was just starting, so I think we got in there before the major distortions would've started to have occurred. Right now we're just starting a study of health workers in Jordan, trying to look at what they're doing, where they came from, what their anticipated activities are for the future, and one of the things we want to look at is whether they come from in the country, so we can get an idea, at least a little bit, of some of their internal activities.

One of the issues of looking at what are known as refugees, and of course a lot of the displaced people in Iraq are not refugees, but internally displaced persons, although the UNHCR has taken a lot of responsibility for this. And we still have what they call "old caseloads" from the Kurdish migrations and the first Gulf War. And so some of those old numbers are mixed in with the new numbers, and it's sometimes hard to sort out. But there's no doubt that there is what demographers would call "demographic churning" going on in the country right now. So we know, that is a real risk in this, it is true.

[48:40] Question: A really impressive study, and I think we're in your debt. I have a three-part question. So, when you get information about the deaths, and you said most of them don't occur at home, do you have any sense of whether they got some medical attention or not, and related to that, is that did you get a sense of injuries that were not fatal. The third one is, with all your experience, although the world, do you have any example where country X cares about the deaths in country Y.

Answer: That's a very good question. I'll go back to the injury ones, because John and I had a lot of discussion about that. We want to collect it on hospitalizations for injury, but I must say we didn't formulate the questions well enough, partly because we didn't have enough time to pre-test them, and to validate them adequately, so the data from that were really inconclusive.

And one of the issues hospitalizations now is that most people who are injured now will go to public hospitals rather than the public sector hospitals, and most of the private hospitals are not part of whatever remaining bit of the information systems working, so there are a lot of interesting questions about that, and I don't think we have those. Now, about worrying about the conflicts in other countries. I think there is some, one of the instances that we've had come to mind this week, is when we had discussions Srebrenica?), and there has been an enormous amount of angst in the Netherlands over the failure the Dutch troops to adequately support and protect the Muslims in this supposed UN safe area. But I think in some extent, you have to be a certain distance away from the before you can start thinking about this really thoroughly, and I know, it certainly in the UK there is still considerable amount of guilt over certain events in the colonial era that has permeated society.

This past year I've had the opportunity to spend some time at Hiroshima, and to see the concern of many groups in the US related to the bombing of Hiroshima. So, I think it's a bit out of my purview, so if you don't like my answer ask someone who knows more about it.

[51:25] Indistinct--Something about hospitals and non-violent death rates.

One that comes to mind right now, is that in one of the University hospitals in Baghdad, and of course that some of you might know, medical specialists went to the US or UK to get their training, and before the invasion there was something in the area of 120 surgeons with faux qualifications either the US or the UK. The report that I had a month ago is that they're down to around two now, and if you're medical student now, you're doing many things that a consultant physician would do three or four years ago, and if you're medical student graduating from Baghdad these days, there is no way you're going to get a transcript, because it is impossible to get out of the country in practice medicine somewhere else; the intent is to keep as many people in there to fill in the gaps. So a little bit about the human resources side of things, the issue of electricity, and the issues of getting to work safely and so forth are clearly demoralizing. The BBC, I think, I had a series on hospitals in Baghdad last year that I felt was very reveal

[53:17] Again indistinct

Statistically, we did not see an increase; we saw an increase was not statistically significant in nonviolent deaths.

[53:28] I understand that you had to exclude the Falluja survey from the whole country data, but go back and look at that data independently, can you see what happened in Falluja?

As I said, what we did in the beginning, is we oversampled one by chance, we got Falluja again the selection process, it wanted one cluster, and we did three there come in all three the mortality rate was about the highest of any of the clusters we had the rest of the survey.

However, that we have a huge problem with the denominator, because we couldn't even come to an agreement on what the population Falluja was. Before the invasion, the commonly accepted number was 500,000, then shortly after the invasion had been reduced, then when the US was trying to make a point about how Falluja have been pacified, and such a large percentage of the population had returned, the population had dropped to 200,000. So, it makes her percent look better, but it makes the absolute number will probably not very good.

So I don't think we have enough numbers to say specifically, categorically what happened. But, clearly airstrikes were huge issue in Falluja, and other causes of death were common as well. But other than that, and as I said, when we put the 2006 data together with just by chance we got the one cluster that got the lowest mortality, but still it was an outlier.

[55:12] What about civilian deaths of Iraqis, compared with those in the military or in the police force?

That's a very good question, and I wish I could answer that, but in this survey, that's not a question you can easily ask the households. Where you remember the militia, or you remember the police. In some cases, a fair number of cases, spontaneously the households responded that these were police recruits that were lined up to be recruited, there was a bomb explosion and they were killed. So we know that was an issue.

[55:50] Indistinct--something about Iraqi soldiers

Well I'm sure that some of those captured in this were combatants, but who they were, is not something we can really tell with this type of survey.

[56:19] So when you say civilians--

Well, actually we say Iraqis.

[56:34] Well first of all, thank you for your very important, if sad work. I sometimes feel, as if we should be counting less and mourning more, or doing something about it more, I believe you that you are and I thank you for that. When the first one came out, it was attacked, and I have two questions about the way this report was attacked, and the way your work has been attacked. The first is, how do you see the balance in the coverage of the report on one hand, the substance of the report and the methodology, as opposed to the attacks on it. Do you feel that the report has been given a fair hearing on the way it has been covered, first of all. And second of all, in terms of the attacks, the first I heard of them was Bill Kristol dismissing them at a forum that I happened to be at, it was not on that topic but in passing he alluded to it in a very dismissive way, as if it was just a known fact, as if they were something that can be dismissed. So I'd like you to address the specific attacks, and comment as to whether there was any credibility. You commented on a few of the criticisms, but as for the attacks presented to the public, could you address any in particular.

Well I say overall, the second study had much more traction than the first study did. And I think that in the second study we learned a lot from what the first study did. I think that's a lot methodologically, the second study was a lot more sound for study was. So just from survey methodology, we learned a lot from that and we applied it, and I think that if we did a new one, there would be a lot of other things we would do as well. The second study a lot more credibility, I think, overall. People were prepared from what they'd seen on television, people were prepared from the first study. People who took time to look at the first survey, and people who looked at the second survey, and look at the comparison between the two surveys, saw the similarities, saw the issues of with death certificates and so forth. So, I think overall, it's had a lot more credibility. And, I think that with the second one, we try to dispel the idea that there were major political motives behind it, and I think that has been a bit more successful; it's not so easy to dismiss a political gesture in some way, and we've also try to put more emphasis on the fact that we are talking about big numbers; were not wedded to specific numbers, whether we take the bottom end of the confidence interval, medium end of the confidence interval, the high-end or wherever, there is still a catastrophic event that's happening to the populace. So I think in general, we've had a lot more credibility.

Just as an aside, I haven't mentioned before but, one of my students, my former students works at the USAID office in Washington at the headquarters, and USAID is one of the principal funders of cluster surveys around the world, and when this report first came out, he was immediately sent to USAID, saying, "USAID you know about cluster surveys, please discredit this one". And, so I talked to several people, who had been there, and they said, "you destroyed our whole Friday afternoon with this, and in the end we sent a message back saying 'this looks like a credible survey'".

So I think at some level, there is an appreciation of the methodology and so forth. One of the things I found discouraging is that much of the press did not take the time to really

think through these issues. We tried to present it in the Lancet as straightforward as we could, and I think in some areas we summarized things a little more than we should have, and people tried to read between the lines and see things that weren't there.

As far as valid criticisms, any time you're doing a survey where you're limited in the number that you can do and maintain the safety of your team, you'd always like to have more data to be more precise on things. The thing that really concerns me more than anything else is this issue of migration, and when we take this process forward to try and look at what we can do better in the future, that's one of the technical issues we're going to have to think about; how to deal with these migrations.

[1:02:55] So, full disclosure, I've been to Iraq, and I made a video project [indistinct, something about insular neighborhoods that have been closed off and the effects of clustering]

We had some criticism about the baseline crude mortality, which we found the first time to be 5, the second time to be 5.5. The thing that people found, is that it should be much higher, considering all of the events that Iraq has been through, the problem with public utilities, and so forth. However, we got the number twice, and it's fairly close to the estimates of the US Census Bureau, which I think is 5.6 or 5.7, and is also in the CIA factbook and other people have different numbers. But if you look at the crude mortality rates for the neighborhoods, you look at Kuwait, Jordan, Syria, and Iran, and so forth, they're all about the same. So they're generally all in that area. It's a bit higher, so that might shift the numbers up a bit, but I think we're basically in that particular area.

Clustering is a problem, but mathematically you can calculate the clustering itself, so you can see what is the probability that these houses are very similar to each other. And when you design a cluster survey, you assume what is called a "design effect" of two. So you double the size that you would normally have, for that number of households if it was just randomly selected. So turned out our design effect was around 1.6, so not as much as clustering effect as we had anticipated in the design. Saying that, there was one cluster, and I don't remember exactly where it was geographically, where there had been a number of deaths from a car bomb, right in that particular area, so this is a risk, and this can skew the numbers, and there's no doubt about that. If we had the opportunity to do a bigger sample size, I'd be more confident, if we could spread those clusters out a bit more, for the same reason you say, very insular neighborhoods, but that's a calm all of the world, that's not just unique to Baghdad. So I'd be a bit more confident, but I think from a public health practice side of things, that the results stand fairly well on their own. I don't really have problems with that. Migration is a key issue which we need to come back to more an address.

[1:05:10] I think in terms of credibility, the craziest thing I've heard is your refusal to release the data, making it impossible for outside researchers to look at the data and computer models and whatnot--

I want to talk about that first, before you get on to your second question. Because our team in Iraq was very nervous about all this, in fact Riyadh went into hiding immediately afterwards, and then went off to Amon (sp?) for a while to keep his head down, he felt just as unsafe there, he felt in the end he is just as vulnerable in Amon as he is in Baghdad so then he went back. So we agreed in the beginning, at his request, but we would not share the data. But we had the intent of sharing it all along eventually. So what we're doing right now, is removing any identifiers which would give suggestions as to which neighborhood,

and we plan to release this in the near future to selected universities and other groups that we believe to have the capacity to analyze in an unbiased and straightforward manner. So, it is our intent to do this. Okay now on with the other question.

[1:06:25] The question was that, can you give a little detail on the random sampling nature of the process, because that's where I've heard the most plausible criticisms I've heard.

Well, it first off, we've had criticisms in the sampling, but the fact that the rate so closely tell each other suggests very strongly to me that this system that we use of random sampling of the streets was virtually identical to using GPS units.

[1:06:54] When you did the survey, did you tell your team, "Okay, now go to this address", or were they actually in charge of that?

No, they actually did the selections there. We together the ground rules for this, we agreed the ground rules for doing this, and this is not very different from what we would do if they were looking for musicals immunization coverage in urban Nasaka (sp?) or something

[1:07:13] So they had a laptop computer and they would press a button and it would randomly street name--

No, they did it on paper; they'd write down the street numbers on pieces of paper, and then they would randomly pick out one of those from the hat, as it were, the things that we were doing in the 1960s, they did that. We got criticism, because at the end of the process they destroyed all the little pieces of paper, which I think most of us would've done anyway, but that was thought by some to be evidence we should've kept. On the other hand, we felt that from an ethical standpoint, we promised to eliminate all unique identifiers, and that was a unique identifier that we should eliminate.

[1:07:53] So they went to the house, and then they--

Once they selected the streets, then they numbered to the houses, one to whatever the end of the street was, then they randomly, using serial numbers on money or whatever, they randomly selected a start number, and started with that house, and they went to the nearest front door, the nearest front door, the nearest front door, until they had a total of 40 houses.

[1:08:16] But if a neighborhood was too dangerous, and they went to a different neighborhood--

They had the option to say, if the neighborhood was too dangerous, and then you could either come back, or you can select another one. Where this was a real problem was in Bazra (sp?), and they had to go to Bazra three or four times, before it was finally safe enough to go. But they decided that they were going to go to the neighborhood that was selected, even if it was a bit dangerous at the moment, they'd come back, they wanted to stick with it. In the one case where it was simply too dangerous to go, we had rules about this, we went to the nearest city or village or whatever. However, the replacement one was across the governorate border, in another governorate, so we dropped it from the analysis.

[1:09:40] So the bias in doing that, would not have inflated the figures. It would have to have been downward. So that's a nonsense criticism --

--Their claim is that it depends on sort of the composition of the survey team. If the survey team were all Sunnis, so certainly they would feel safer going into certain areas, which would be different if the survey team was all Kurds, so who would feel safer going to a neighborhood that was completely controlled by the government, or contested by insurgents.

-- we'll come back to this. Moving on sir, you --

[1:10:26] I was struck that 92% of the people had death certificates. Does that imply that sometime in the future there'll be a source of data available --

That's a very good point because, and I was struck by this in the beginning, and the tradition has been that you had had a death certificate because, first off you couldn't be buried if you didn't have a death certificate, secondly if you were to get any kind of unemployment or early termination benefits, the family inheritance or anything, you had to have a piece of paper for it. So it became a very ingrained kind of process. You got these from the public hospitals, sometimes a public hospital would give you the death certificate without seeing the body, but almost always they had to see the body, for adults. For children, not always the case. In these forms were filled out in duplicate or triplicate, one went to the person, one stayed in the facility, and one, in the past, went to the bureau that handled vital registration.

There was a suggestion now, that families would pay a little money under the table routinely to not pass on the certificate to anyone, if there were a contested area or something, that would make them a target in any way. So I think there's an argument, that death certificates are still being done but they're not moving up the system in any way.

[1:12:10] Thank you for your work. My question is, you showed that 14% of deaths in World War I were civilians during the conflict, and it steadily increased percent and now it's in the 90th percentile. What's your view on the increase of the percentage of civilian deaths among total number of deaths?

I think one of the major ones, has to do with the use of air power. The Pentagon makes a claim, and I'm sure they're right, that place of a much higher precision now than they had in the past, but it doesn't necessarily mean that the intelligence on the ground is at the same level. In fact one of Les Roberts' friends was involved in targeting airstrikes in the early days of this war, and he mentioned that they would look at aerial photographs, and they would see, in front of a house there were no cars yesterday, and today there were two cars, so obviously there were some sort of meeting going on, so bomb the house. So that's a level of intelligence that may go into some of the targeting. As the things like missiles, or air power, things like cluster bombs, the basic technology of this has expanded so so rapidly, I think that's a major reason.

[1:13:36] Indistinct--something about children

There's not enough data to do age-specific death rates. That's a very good question, and if one were to do a survey in a more peaceful situation, as the first thing you want to look at. Because there's been a lot of issues about, deaths among children, both under Saddam and postinvasion and which numbers to use, there's no question that the data has been manipulated, in fact I think they've been manipulated by everybody, so in without starting again I don't think we have good enough evidence. So that would be a number one thing I'd think we want to do.

[1:14:34] Indistinct--something about an article in which Iraqi people who worked in nuclear silos were assassinated

I don't think so; that was one of the questions on our questionnaire, "were you a nuclear scientist or not". But I think from the media, and from the reports of the people working in Iraq, we know intellectuals, professors, other people are targeted, this is not unique, this goes back to Paul Potts and well beyond that. So I'm sure this is going on.

[1:15:13] Are you going to go back to do another one, or are you going to move on to similar places and do surveys there?

Well actually the first one that we did, we thought, "well we're not sure we want to do this one again", we'd like to have someone else do it again, and that was our position until John called me on the telephone and we decided we'd do it again. But from a scientific standpoint, whenever you finish something your immediate thoughts are "if I were to do this again, how would I do it differently", and of course we have those thoughts, I think it's not now time to do that, but I think there is a time. We've shown that recall bias is not the problem that we'd anticipated before, so that we could get good data. We have the information from the death certificates, I think we would do next time some careful scrutiny of the death certificates, look at places where you can photocopy the death certificates and get some information on that. There's a lot more things we can do, I think next time before simply, I would like to see how we would use Google Earth to the sampling. I think that's an attractive mechanism that we all have available, and it will short-circuit some of the criticism that we have with sampling methods. So I think there's a lot of things that could be done, and from a scientific standpoint that would be great.

[1:16:41] What do you think of the perception that Democrats care more about the suffering in Iraq? Have you been invited to Congress to brief anybody?

Yes actually, we have, we did a briefing in Congress. And it's interesting that the person who first called me up to ask about this was a Republican congressman saying -- and this was shortly after the article came out -- "you know, on both sides, we are concerned about things. The general feeling both among Republicans as Democrats is that something has to change here, and we had to take a bigger control things. So we want you to come and tell us what did you find and what does it mean." So I think there's been an interest. This was on C-SPAN, I guess in early December.

[1:17:35] Indistinct--You said these death rates in such a low-key way. And of course these death rates are absolutely horrifying. What is fascinating is that, is that most of the modern world has forgotten. I commend you and your team for being brave enough to have actually seen these kinds of sufferings. How do you explain the immense difference between it and the lowest of these death rates and say, those of the British government, which excepts 40,000, or something like that. How do you explain this immense difference? And what do you think of the newspapers that have tossed your extraordinary survey to the side?

There's a lot to think and talk about there. In public health we spend a lot of time asking people. One of the basic principles is, you go ask people and they'll tell you what's happening. Obviously we have to sample in a represented manner, and so forth. So when we got criticism for this, the one criticism that sort of amused the public health community more than anyone else was the comment from John Howard in Australia who said, "I can't

believe this Hopkins data is only based on house to house surveys."

The basically in public health for a long time we've know that there are two kinds of data. There is the data that that you get from what is called passive reporting, so if the doctors offices reporting cases of sexually transmitted infections, and so forth, that just goes of the system. And then there's another set of numbers you get from active surveys, which is when you actually go out and look, and those number is always much different from each other. For example if you find out in the case of Massachusetts how many sexually transmitted infections were there in the last year you get one number. If you go out and survey the population you get a number that's two or three times bigger than that. So this active and passive thing is very much a public health issue. And we're looking at data in developing countries, it's easy to get data from hospitals and clinics, but that never tell you the whole story. And you cannot go from that number, especially in a dysfunctional or nonfunctional situation, to a national survey. You just have to use different methods.

Now as far as dispassionate and courage and so forth, one of the things we learned when we started flailing about in public health, is that we can produce numbers, but were not very good at the advocacy side of things. We can't really get the message across what this means. And so we need the help of other people to do that, we're not very good at that. I think we are selected to be not that kind of advocacy people. But that's one of our failings. We need to be more advocacy oriented about some of these things.

[1:21:10] Indistinct -- I understand that advocacy is not one of the strengths of a public health professional. But if you just look at these numbers they're absolutely appalling. And I'm just wondering why he not everybody is so appalled, and I know you can answer that, but in Congress are there people who have the sense of the enormity of these numbers, is it that you're being squelched and criticize so much for the process, or are there some people that are trying to make some sort of political message of this?

This is an important question. My experience in meeting with a lot of staffers, a lot of people working in the Senate and Congress, there's a ready acceptance of the numbers. There's a realization of what the numbers mean, and so forth. But above that level, and of course as a political strata to think of that deals with its interpretation. So I think at many levels, people take time to think about the numbers, and there's an appreciation for this. As far as making a good case, if you invited my colleague Les Roberts instead of me, he would have been very much more dramatic in this, and I've tried to be the science side of things, and he's tried to be the advocacy side, so we probably should do this as a team actually.

-- So Les is more.

-- Les is more, exactly. [Laughter]

[1:22:42] Indistinct-- In Washington there is an attitude, "during Saddam's years, they were 'x' number of people killed, and we are still under that". But why do you think Iraq Body Count has been so vociferous in countering this, on an advocacy issue they're in it for the same reasons, so why do you think they are so against your study.

I think on one hand, they are defending their methods, which is using media surveillance, and there is other evidence from when media surveillance was used in Central America that it misses a large number of things, so we know that that's not a comprehensive method. Now, I try to be sympathetic toward Body Count, because as incomplete as facility-based

data is, it's still important, and in public health we have this approach we sometimes use called signal surveillance. When you can't measure every place, pick out some key places where there's media, where there's mortuaries, where there are certain hospital as they keep good records, and follow what the trends are. And these are important to look at the trends, so I think that is important.

Les believes that Iraq Body Count, which is dependent on donations and so forth, has been damaged by other methods of reporting, and that's the basis of things. But on the other hand, from a scientific standpoint, you can become very best in what you're doing. You can become very defensive about it, and cannot see what the shortages are and difficulties and so I think we may have had that kind of experience. I think if you're doing is long enough sometimes there's just a big blank spot where you can't see these things.

[1:24:43] I wonder what your thoughts on the Iraq living conditions survey, which is the only other epidemiologic survey to tend to such mortality, and if I recall the figure was around 25,000 for early April of 2004.

Yes, that was a very competent group based in Scandinavia, Petturson (sp?) and his group that were doing that, and they've done excellent work, they've done good work in Palestinian camps, they've done good work in Lebanon, and they are well known and a very competent group. They did a very large survey. Many many many clusters, and the reason for that is they want to compare each governorate with the other governorates, and you have to have a lot of clusters to do that. They had one question about mortality, and when they went back later on to doublecheck on this, they found that in the case of children, where they did a small sample, then missed about half the deaths. So it was not a study designed to look at deaths, and it was not a study powered to deaths.

[1:25:52] Indistinct--I'm not an epidemiologist, but some argue that there are special issues, it's known that child mortality is hard to estimate, and they had no reason to believe it affected adult mortality rate, that's why they didn't re-ask it.

Well I think the other thing is, when you do questionnaires, you have to focus on a specific issue. And the UNDP one was looking at development issues, and it was focused on that, and it wasn't primarily focused on mortality. If you were to do that, I think you would've had to construct the questionnaire differently. But, it is very interesting data, and I don't want to discount it, he's a very competent person, and they had a very competent the team to do it, it's just that I don't think it was was asked in the depth or breadth that couldn't produce the data that I think would be more representative.

[1:27:03] Indistinct -- First of all, in response to to your comments about that study, and I haven't read it, I think the press assumes that all Shiites are created equal . . . and a lot of the violence comes from cultural differences, and I think it's really racist, not that you are racist, to categorize all Islam that way . . . and there was a very large-scale action . . .

I believe we had one cluster there, but I have anything specific on that, we didn't look at that in great detail. I think falling on your other point, I think that the criminal groups and criminality and so forth are now self financing and self-perpetuating thing which I think is playing a bigger and bigger role, and I think teasing all these things out together, I think in a survey like this it's not possible to do.

Introducer: Okay, I think we all owe you some thanks [applause]. I want to go to dinner . . .

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