Healthy scepticism

GW: How did the WHO get involved with Syrian chemical weapons? There is a great deal of demand on WHO time, and every day there are incidents in Syria with major health impacts. Prior to Ghouta, what brought WHO into the chemical weapons picture?

MB: The answer is sheer size. WHO always tracks the public health aspects of any significant event or incidents. Our system follows International Health Regulations (IHR), a global treaty that came into force in 2005, and regulates the public health alert and response at international, regional and national/local levels. Without limit on the aetiology of the sources of the public health event, if there are victims we need to understand what is happening: communicable disease, non-communicable disease, chemical release or even something like Fukushima. It is the bottom line, our mandate.

While systematically following all rumours, when something large scale arises we perform a risk assessment and gather information. If it is a deliberate incident, both doctors and cops will arrive on the scene: and this also
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Happened in Khan al-Assal on the morning of the 19th March 2013. We followed the standard procedure to understand what the victims went through, the symptoms and what type of possible exposures, and to see what advice could be provided to the authorities - a pure public health mandate. On March 21st there was a request to the UN Secretary General (UNSG) to open an investigation. To deal with the many allegations of CW use in Syria an ad hoc team with diverse expertise was created in WHO.

The United Nations Mission to Investigate Allegations of the Use of Chemical Weapons in the Syrian Arab Republic was then formed, under the leadership of Professor Ake Sellström, and composed of representatives of the Organisation for the Prohibition of Chemical Weapons (OPCW) and WHO on March 22nd, with an initial five people seconded from WHO. I was deployed together with another three colleagues as part of this investigation team, and lead of the WHO component, hence my signature on the report. This Mission lasted from 21 March right down to December 12th when we handed the report in. One of the first steps was compiling a very detailed standard set of questions to be sent to each requesting party (UK, France, Syria etc.). At the start of the investigation we needed to methodically review the detailed description of the event by the requesting parties - where the impact point(s) were, type/quantity of agent used, number of people involved etc. The greater the number of details the easier and more informed the verification/investigative process will be.

**GW:** WHO had an office in Syria before, during and after the attacks. Did you see a big change in how the Syrian government treated the WHO before and after the Ghouta report? Even though the report resisted attributing blame, it would have put WHO in a difficult position. Did you see any change, or did it remain the same?

**MB:** The investigation team was not there as part of WHO. The WHO, UNICEF and UN family at large are all operating in the country on their regular mandate such as HIV/AIDS, support to children, food safety, the things we normally do in the UN humanitarian field. This Mission was under a different mandate, a different type of operation and part of the UN. In terms of the results of the Mission, I didn’t notice many criticisms of our scientific methodology, chain of custody and technical analysis, either internally or externally. Any differences of opinions were mainly on the political nature or an interpretation of findings – both of these were outside the Mission mandate. WHO was invited to be a component of an investigation, but I was not acting as a WHO official but as a member of a UN Mission: it is a fine line but it is important. I was not aware of any negative spin. For the first time, compared to the reports of other investigations, the science was widely praised.

One thing that is paramount while reading the Mission preliminary report on Ghouta is that we had only five hours on site, within the contested areas, over three days. The facts and samples we collected and compiled from the sites and for the public health side of the investigation, was done in little more than two hours: interviewing survivors and first responders, taking blood and other biological samples, finding out where the impact point was, and reaching that point across a war zone, getting suited for CW, taking samples, decontamination etc. It is almost impossible to do any better in war-like conditions in such a short time effective time.

**GW:** There is a wide variety of skills in what you described. In terms of the WHO team, while they have extensive clinical and epidemiological skills, where did their CBRN knowledge come from?

**MB:** Some of my colleagues and I have had advanced CBRN training. Our role was not clinical treatment in nature; it was related to the understanding the underlying facts and the science supporting these facts.

We had to provide the science, rationale for our activities and a solid chain of custody during the investigation, in order to withstand the future debate on the Mission findings. So when the counterparts asked: ‘Why do you need this sample?’ or ‘Why do you need to talk to this witness?’ we could explain why, in terms of a scientific approach to address the main question in our mandate: whether or not chemical weapons were used.

For example the number of samples collected was related to the estimated size of the incident in Ghouta as well as to the operational and security constraints. How many samples do you need to make your case? The total number of biological samples collected, was determined by the possible number of victims, estimated in the range between 440 and over 1500, and by direct assessment of the situation on the ground.

The selection of survivors was based on the capacity to directly observe people who presented the most severe condition/symptoms and who suffered the loss of the largest number of family members. If the survivor lost several family members, then presumably he/she was closer to the points of exposure. In the interview he/she indicated to the Mission the suspected impact point. The team then could obtain independent verification by cross checking all the stories once on site. It is difficult to stage a ‘Hollywood production’ if the inspectors independently choose suddenly where to go. The results of the victims’ interviews points to where the impact was. We were taken to the first impact site by an eighty year old lady, whose family was all killed. The methodology gave us the data and the confidence to write our Report.

**GW:** By the time you got into the field to look at the results it had been nearly a week. Surely the best you were expecting was sarin’s degradation products, instead you got good samples. That must have been a surprise?

**MB:** Don’t tell me! As it was shown on videos posted on YouTube, in some occasion the held hand detector of the
inspectors got a positive readings up to a few bars….! Many assumptions about how sarin behaves in the field may need to be re-assessed. Some of the features and facts collected on large scale event like in Ghouta, may point to much higher resilience in the environment. We cannot know the whole story without a serious scientific analysis, but this cannot be done at present.

The Team could determine through epidemiological interviews, with the aid of a local map, the pattern of exposures/victims in large scale and over time and space. The victims that were mobile, or first responders who helped others, moved towards the health centers and many were dying, because the sarin was taking effect. Several first responders and care takers got secondary contamination and unwittingly supported the diffusion of the agent. When you looked at the map you ended up with a ‘sea-urchin’ like constellation of cases.

GW: The rocket that crashed through the roof (samples numbers 02SLS or 05SDS for example – from the December 12th final report) seemed to have some of the clearest signals, but this was contrary to the environmental factors, which suggested that exposure to the elements would have provided lesser signals. Why did you think this was? Did you feel that the other rockets had been moved, and this was more of a virgin site?

MB: No I did not have any reason to believe that it had been moved. This is not CSI Miami - in the real world it is difficult to make everything perfect.

Anything as big as a rocket contaminated/filled with sarin will kill the handler. Full protection is required (especially in such a hot climate), Ghouta is a large and crowded area and transporting a missile through it, in full gear, will result in someone seeing it and possibly putting you on YouTube!

Again, there has to be the caveat that we did this in only five hours, effective time on-site, if we had been there a month the data would have been better. We had security and technical constraints, there were shootings and tension, but time was the major constraint. Even though we had a cease fire, I was in car number one on the way to Moadamiyah when the convoy was shot at. Our car came back on two rims, we changed the car and returned in. If the UN Inspectors are seen to be chickens due to five or six Kalashnikovs firing then everybody else would have shot at us next day. The return of the UN staff to the contested areas was mission essential – we had to perform our fact findings mission with the survivors and collect samples directly from victims – but it wasn’t risk free!

GW: If you had to advise a team going in, if it happened again, what would your lessons learned/identified? There is a good chance that short duration missions will become the norm, and other teams might have the same challenges, so what lessons would you say are essential?

MB: What WHO added was complementing the pure forensic interview methods, where you interrogate a witness thoroughly for hours. We had three minutes to ask each person four questions, including translation. This person is in shock, can barely talk, the rest of his family is dead… what questions do you ask?

In addition, the questions must be standardised to add reproducibility to this type of epidemiological approach. Gatherings facts on space, time, description of what happened in order to independently verifying the evolution of the event was new in this UNSG investigation and appreciated by the Member States. It forced a change in the norm. When you experience technicolour it is difficult to go back to a black and white TV! This approach hopefully will become a new standard that could be consider in future missions.

The first question we asked survivors was: ‘Were you on the ground floor, at height or in the basement?’ This was in order to reconcile the proximity of the victims to the source of exposure, especially in cases with a lot of casualties in the family. They could have been in the kitchen on the first floor, because that is where the rocket hit, or in the basement as sarin is heavier than air. Survival depended on how far the victims were away from the source of exposure.

The events in Ghouta and Khan al-Assal had a very large impact in the emergency response systems. You cannot hide it, the response must have ambulances, those ambulances will need fuel, there will be several hospitals involved. The footprint in society of an event like these is very large. Khan al-Assal was visible, you find something substantial, as opposed to two soldiers here, or five there, which is harder to verify after six months. Other allegations were smaller in scale and required adapted methodology of investigation.

GW: When we watched the videos there was much concern over the lack of secondary casualties since nobody seemed to have any gloves on, yet people weren’t getting sick. This lack of secondary casualties confused a lot of people when they tried to work out what was happening. Did you get a sense of the scale of the secondary casualties?

BM: We had secondary casualties. Of the people we selected to sample, several were health care workers. The sister of one of them was a nurse who died from helping others. They washed victims with water in buckets/hoses and that helped, but some contact and off-gassing from contaminated clothes was unavoidable.

As regards the lack of autopsies, it was decided that with the amount of evidence we had, it wasn’t necessary to dig. The evidence was so overwhelming, clinically and epidemiologically, that you didn’t need to dig. The situation was very tense and emotionally charges. For future missions attempting attribution that would be a potentially area of investigation, but it was not our mandate.

GW: While no-one doubts that there was a significant attack in Ghouta, there is still a discrepancy in the figures. There is the MSF figure and then the US/FSA
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figure, which is about a thousand more. Ake Sellstrom, in the last issue, suggested that the hospital’s figures didn’t add up, that they didn’t have the throughput to deal with those sorts of figures. What was your opinion on this? Were the figures padded, the same people showed up at many hospitals, or just confusion?

MB: Unfortunately the hospitals in this conflict are key targets. Both sides shell and destroy hospitals, and target health care workers. It is the one military target they really look after, so a lot of the fighting is over the hospitals. Destroying enemy care centres is seen as a major tactical gain in this conflict.

Due to this, the protection of the hospitals is preeminent; it was highly sensitive information, for obvious reasons. We were brought to facilities but we knew that most of the people were brought from other facilities to our hospital, and we had neither the time nor the trust to go around and check hospitals and other facilities. So the garage hospitals and facilities that we observed were of limited capacity. In terms of health care they may, or may not, have been the entire capacity of the region or area, but due to the limited time on site and the sensitivity of the subject, we could not assess all the existing medical capacities.

We saw a portion of a reality in two/three hours. If I asked you how many hospitals there were in London you might think of few big ones, but there are possibly another fifty smaller ones, first aid points and clinics and so on with basic tools that could provide basic help to people and this thus becomes a ‘hospital’ in such extreme conditions. As Åke said, what we were exposed to was not the entire picture.

GW: Did you feel that the survivors were coached to show a certain element of the attack? 70% of your subjects were male, they were largely of fighting age, so might be under FSA control. Did you feel that you could winnow out anyone who had been coached so that you were only seeing the worst, or a view of the incident that someone wanted you to see?

MB: Our verification methodology aims at minimising the risks of being ‘coached’. The survivors were severely affected, in confusion and with all clinical symptoms that you cannot fake, especially in the acute state that they were in. Some needed oxygen and you needed to hold them down on a stretcher.

We were able to select those survivors we wanted. They could not know and prepare people beforehand. You would have had to concoct the whole story of these people, their families and neighbours, so that when we went to visited their areas it all added up. The amount of sophistication needed to cross check four or five independent questions was too much; it would have had to be planned for years, it is just too complicated.

GW: While there is a lot of military information on sarin exposure it tends to be for fit males of military age. Much of the clinical and environmental information on sarin in a mixed urban population was unknown. Were you surprised that 5-6 days after exposure, and treatment with atropine, that there were such strong signs?

MB: In one case we found sarin degradation products in the blood of a survivor, above the established threshold, a month after exposure. A lot of the previous tests and data concerning sarin in the body were done in-vitro or laboratory condition. This data may need to be reconsidered in the light of Ghouta. Several follow up studies will be necessary in the future to better understand the long terms effect of sarin in the body of such large number of victims. For example, the Tokyo sarin incident in the subway had a much smaller number of victims but as of today we still have about 4,000 people under observation for long terms effect. As soon as the situation on the ground is improved, this study ought to be done.

GW: One of the theories we had regarding the persistence of signs and symptoms was that the atropine they had was of a lower strength and had not been stored properly, or they were not providing enough oximes etc. Do you think there was a proper clinical response for organophosphate exposure?

MB: Remember, the scene must have been overwhelming. People were dying in the hundreds, just falling down. They didn’t have any protection, they were civilians of all ages and didn’t behave like trained soldiers. The atropine dosage for a 20kg child is different from what you and I need. It was 4.00 am, it was dark, there was extensive bombing and the attack was appallingly effective because it was unexpected – far more so than any military grade attack we would study in a textbook.

The scientific community may need to rethink the exposure curves and diffusion of sarin. The original diffusion was done by gas, but it was achieved by people moving it themselves; they became sources of exposure. This is why the forensic epidemiology becomes important. Analysing these dispersion models should complement cloud diffusion modelling with models closer to a communicable disease outbreak with human-to-human transmission.

GW: Since Ghouta there have been other incidents, most recently at Kafr Zita. Can you see there being WHO investigations in Syria in the future? Would it be something that you personally would want to do, or have you ticked that box?!

MB: WHO follows all these incidents just as we did monitoring/watching them in the past. Our team is monitoring within the scope of our public health mandate. Whether there will be another investigation will depend on an official request being filed by a country to the UNSG or OPCW. Now that Syria is a member of OPCW these requests can be done via OPCW if it is a chemical material, so a Member State of the CWC can ask for this to be investigated as a pure OPCW matter - they have their own mechanism for this.