

# Briefing Note: The Alleged Chemical Attack in Douma on 7 April 2018, and Other Alleged Chlorine Attacks in Syria Since 2014

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In-depth Report: [SYRIA](#)

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## Introduction

*The alleged chemical attack in Douma on 7 April 2018 led to a missile attack on Syria by the US, France and UK. This briefing note summarizes the results of further investigations of the Douma incident and explains relevant scientific issues. This note also examines the processes by which OPCW Fact-Finding Missions and the UN/OPCW Joint Investigative Mechanism reached their conclusions that chlorine had been used as a weapon in earlier alleged chemical attacks in Syria.*

The primary sources for the alleged chemical attack were [images from three locations](#):

1. a hospital scene in which children purported to be victims have water thrown over them (FFM Location 1)
2. a four-storey apartment building where images showed bodies of 35 victims and a gas cylinder lying over a hole in the roof (FFM Location 2).
3. a room in an apartment that has a hole in the roof and a gas cylinder on a bed (FFM Location 4)

Suggestions that a nerve agent had been used in Douma

The speech of the French representative (Francois DeLattre) at the UN Security Council on 9 April 2018 was [reported by the UN press office](#):

Noting that thousands of videos and photos had surfaced in the hours following the attacks — showing victims foaming at the mouth and convulsing, all symptoms of a potent nerve agent combined with chlorine gas — he said there was no doubt as to the perpetrators, as the Syrian Government and its allies alone had the capability of developing such substances.

On 13 April US officials [briefed CNN](#):

Biological samples from the area of the alleged chemical attack in Syria have tested positive for chlorine and a sarin-like nerve agent, according to a US

official familiar with the US analysis of the test results. A western official told CNN that it is not conclusive but officials suspect the substance used in the attack was a mixture of chlorine, sarin and possibly other chemicals.

An [official press release](#) mentioned symptoms that “suggest that the regime also used sarin” but did not mention tests on biological samples. By the following day, [US officials briefing the media were more confident that nerve agents had been used](#):

“While the available information is much greater on the chlorine use, we do have significant information that also points to sarin use,” a senior administration official said on a call with reporters, citing reports from media, nongovernmental organizations and other open sources. “They do point to miosis — constricted pupils — convulsions and disruptions to central nervous systems. Those symptoms don’t come from chlorine. They come from nerve agents.”

On 11 April the former British Army officer Hamish de Bretton-Gordon, widely quoted as a chemical weapons expert, [briefed the FT](#):

“There’s no doubt this was a major chemical weapons attack,” he said. “The big question is whether it was chlorine or sarin. I am favouring a mix of the two.”

and on 16 April briefed the [Daily Mail](#)

‘What they’re describing is chlorine and what we suspect is a nerve agent mixed with chlorine.’

[A similar opinion was expressed](#) on 16 April by Raphael Pitti, a former French Army officer who, like de Bretton-Gordon, has had a role in [collecting samples](#) from alleged chemical attacks in Syria since 2013:

The UOSSM also concluded that the symptoms of the casualties were consistent with exposure to a nerve agent, possibly one mixed with chlorine. Dr Raphael Pitti of UOSSM France said he thought “chlorine was used to conceal the use of Sarin”, a nerve agent

Other experts noted that the images showing victims’ bodies close together in the middle of the apartment building, having made no attempt to escape the gas by leaving the building or moving to the window, were more consistent with exposure to a nerve agent than with exposure to chlorine. Alastair Hay, a member of the OPCW Advisory Board on Education and Outreach [noted that](#): “people have pretty much died where they were when they inhaled the agent. They’ve just dropped dead” and added that “Chlorine victims usually manage to get out to somewhere they can get treatment”. The Washington Post [reported “outside experts” as commenting that](#) “the speed with which the victims died suggested that a nerve agent was used. Chlorine usually takes longer to work.”

The Prime Minister’s statement on 16 April 2018

The Prime Minister made a [statement](#) on the Douma incident in the Commons on 16 April 2018, two days after a missile attack had been launched without parliamentary approval. She alleged that Syria and Russia were delaying the FFM's access to the alleged attack sites:

Even if the OPCW team is able to visit Douma to gather information to make that assessment — and it is currently being prevented from doing so by the regime and the Russians — it cannot attribute responsibility.

This is contradicted by the [OPCW Fact-Finding Mission Interim Report](#) which explains that although preparations were made to deploy an advance team on 12 April, this was delayed by safety considerations and that the risk assessment was shared by the representative of the United Nations Department of Safety and Security (UNDSS).

Given the recent military activities and the volatile situation in Douma at the time of the FFM deployment, security and safety considerations were of paramount importance. Considerable time and effort were invested in discussions and planning to mitigate the inherent security risks to the FFM team and others deploying into Douma. According to Syrian Arab Republic and Russian Military Police representatives, there were a number of unacceptable risks to the team, including mines and explosives that still needed to be cleared, a risk of explosions, and sleeper cells still suspected of being active in Douma. This assessment was shared by the representative of the United Nations Department of Safety and Security (UNDSS).

Under the evacuation agreement reached on 8 April, [Russian military police were to patrol Douma during a transitional period](#) before handing control to the Syrian authorities. The FFM report explains that at the outset

the formal position of the FFM team, as instructed by the Director-General, was that security of the mission should be the responsibility of the Syrian Arab Republic. During the initial meetings in Damascus, the FFM team was informed by Syrian and Russian representatives that the Syrian Arab Republic could guarantee the safety of the FFM team only if the security was provided jointly with the Russian Military Police.

On 16 April 2018, following consultations with OPCW Headquarters, it was agreed that security within Douma could be provided by the Russian Military Police. A [letter dated 18 April](#) from the OPCW Director-General described what happened next:

The United Nations Department of Safety and Security (UNDSS) has made the necessary arrangements with the Syrian authorities to escort the team to a certain point and then for the escort to be taken over by the Russian Military Police. However, the UNDSS preferred to first conduct a reconnaissance visit to the sites, which took place yesterday. FFM team members did not participate in this visit. On arrival at Site 1, a large crowd gathered and the advice provided by the UNDSS was that the reconnaissance team should withdraw. At Site 2, the team came under small arms fire and an explosive was detonated. The reconnaissance team returned to Damascus.

This incident on 17 April led to a reassessment of the security situation, and the

implementation of [additional measures to mitigate the risks](#) before the FFM site visits began on 21 April:

Once the security reassessment had been concluded and the proposed additional mitigation measures implemented, the FFM team deployed to the sites of investigation in accordance with the updated priorities and proposed schedule.

The Prime Minister repeated the [Pentagon's version of the targeting](#), stating that missiles were “specifically targeted at three sites” [Barzeh in northern Damascus, and two sites at Him Shinsar near Homs] allegedly associated with development or storage of chemical weapons, and that 88 missiles had hit these targets. The Russian Ministry of Defence however gave a [different version of the targeting](#), stating that “The real targets of the attacks of the US, Britain and France on April 14 were not only Barzah and Jaramani research facilities, but also Syrian military infrastructure, including airfields,” and that of the 73 missiles fired against these six heavily-defended airfields all but eight were brought down by Syrian air defences.

Without access to the flight tracks of the missiles, we have no way of establishing which of these two versions of the targeting is correct. In the version given by the Pentagon and the Prime Minister, 76 missiles were used against the research centre at Barzeh: a surprisingly large number for a strike on a single unprotected target. We note that if the US and its allies had been concerned that these sites were being used for development or storage of chemical weapons, they could have requested that OPCW inspect them. After their most recent inspection of Barzeh in November 2017, OPCW had [reported that](#)

The analysis of samples taken during the inspections did not indicate the presence of scheduled chemicals in the samples, and the inspection team did not observe any activities inconsistent with obligations under the Convention during the second round of inspections at the Barzah and Jamrayah facilities.

Interim report of the OPCW Fact-Finding Mission on the alleged chemical attack in Douma

The [interim report](#) of the Fact-Finding Mission (FFM) did not find any trace of a nerve agent in samples taken from the site and from alleged casualties

No organophosphorus nerve agents or their degradation products were detected, either in the environmental samples or in plasma samples from the alleged casualties.



The FFM did not reach a conclusion on whether a chemical attack had taken place, stating only that

The FFM team needs to continue its work to draw final conclusions regarding the alleged incident

The inability to detect sarin degradation products in environmental samples from the two alleged attack sites cannot be explained by delay in sampling as the main breakdown product of sarin — isopropylmethylphosphonic acid — is stable and [persisted for more than 30 years in contaminated groundwaters](#) at a sarin production site in Colorado.

Blood samples from witnesses allegedly exposed to toxic chemicals in this incident were obtained under FFM oversight in “Country X” (presumably Turkey), or received by the FFM. The tests on these blood samples included tests for peptide adducts that are [not affected by aging of the adduct](#). These tests should remain positive for several half-lives of the target protein *in vivo*: this half-life is about [12 days](#) for butyrylcholinesterase and about [20 days](#) for albumin. As the blood samples were obtained no more than 14 days after the alleged incident, delay in sampling cannot explain the negative results.

The environmental samples were reported to contain chlorinated organic molecules such as trichloroacetic acid and chloral hydrate. Such organic molecules in which one or more of the hydrogen atoms have been replaced by chlorine atoms are environmental markers of chlorine exposure, [typically found in chlorinated drinking water](#) and used to monitor water quality. As in previous OPCW reports, no quantitative results were given so we do not know whether these compounds were present in trace amounts, such as might be found in drinking water, or in high concentration as would be expected if chlorine had been released in the buildings.

Possible explanations for the Douma incident, and relevant evidence

As [explained elsewhere](#), the formal logic of inference requires that alternative hypotheses are stated before evaluating the evidence, and that the weight of evidence favouring any of these hypothesis over the others is evaluated by comparing, for each relevant observation, how well each hypothesis would have predicted that observation. Evaluating the evidence favouring one hypothesis over another does not depend upon prior beliefs about which hypothesis is true.

The possible explanations for the Douma incident can be reduced to two alternative hypotheses:

1. A chemical attack using gas cylinders dropped from the air.
2. a managed massacre of captives, with a chemical attack staged by placing gas cylinders at the site and possibly opening them to release chlorine.

Other hypotheses are possible — for instance accidental asphyxiation of victims while sheltering elsewhere, followed by opportunistic staging of a chemical attack — but unless such hypotheses are proposed we shall consider only the two alternatives stated above.

Several witnesses to the hospital scene at FFM Location 1, including an 11-year old boy seen in the video having water thrown over him, have [testified that this scene was staged](#). Staging of the hospital scene does not exclude a chemical attack, though it is more probable under the managed massacre hypothesis than under the chemical attack hypothesis.

Laboratory evidence that chlorine was released is not evidence favouring one of these hypotheses over the other, as it is equally compatible with use of chlorine as a weapon as with use of chlorine to lay a forensic trail.

The most direct evidence favouring a managed massacre is the [positions of victims' bodies at FFM Location 2](#): of the 35 bodies seen, 18 were in a first-floor apartment and 10 in a second-floor apartment. As noted in Section 3, in the first few weeks after the Douma incident several experts commented that people exposed to chlorine would have attempted to escape. With exposure to a nerve agent subsequently ruled out by negative results on environmental and physiological samples, exposure to chlorine from a gas cylinder on the roof does not explain why the victims made no attempt to escape by moving to the windows. Under the managed massacre hypothesis, we would expect to find the bodies in positions that would be convenient for those who were carrying the bodies up the stairs.

Other lines of evidence that favour a managed massacre over a chemical attack include:

- the position of the gas cylinder at FFM Location 2, on a balcony at with its valve end lying over a hole in the roof is improbable under the chemical attack hypothesis (the balcony is only [about one-twentieth of the roof area](#)), but highly probable under the managed massacre hypothesis (the balcony is the only part of the roof that is easily accessible from inside the building).
- the visual evidence that [a fire was lit in the room underneath the cylinder at FFM Location 2](#)) on top of the rubble from the hole in the roof above (confirmed by the FFM's inspectors who took wipes from the burnt wall) is inexplicable under a chemical attack hypothesis, but explicable on the managed massacre hypothesis as a method of releasing the contents of the cylinder.

Other evidence on the Douma incident has been reviewed by [Larson](#)

Alleged use of chlorine as a weapon in the Syrian conflict

Since 2014 it has been alleged that the Syrian armed forces were using chlorine bombs dropped from helicopters. For chlorine to be effective as a weapon, it has to be released on an industrial scale as at [Ypres in April 1915](#) when the German army released 168 tons of chlorine from 5730 cylinders installed along their front line and at [Bolimov in May 1915](#) when 12000 cylinders were used along a 12-kilometre front. This resort to chemical warfare was an [act of desperation](#) at a time when Germany was running out of imported nitrate for



explosives as a result of the British blockade and had not yet managed to scale up the Haber-Bosch process to synthesize nitrate. Although there has been no experience with use of chlorine by a state as a weapon [since 1915](#), there is ample [experience with industrial accidents](#), in which fatalities have been rare unless the quantity of chlorine released exceeds one ton (creating a cloud too big to run out of) or the victims are in a confined space. This experience indicates that:

- for the same weight of payload delivered, explosives would be more lethal than chlorine.
- in a real chlorine incident, the number of casualties that were not immediately fatal would be much greater than the number of immediate fatalities. Some of these casualties would develop pulmonary oedema several hours after exposure, obvious on chest X-rays and requiring intensive medical care.

As [noted by Hitchens](#), OPCW [stated in April 2013](#) that they would provide a formal assessment of whether chemical weapons had been used only if their inspectors were able to visit the sites of alleged attacks:

Weapons inspectors will only determine whether banned chemical agents were used in the two-year-old conflict if they are able to access sites and take soil, blood, urine or tissue samples and examine them in certified laboratories, according to the Organisation for the Prohibition of Chemical Weapons (OPCW), which works with the United Nations on inspections. That type of evidence, needed to show definitively if banned chemicals were found, has not been presented by governments and intelligence agencies accusing Syria of using chemical weapons against insurgents. "That is the only basis on which the OPCW would provide a formal assessment of whether chemical weapons have been used," said Michael Luhan, a spokesman for the Hague-based OPCW.

Luhan was [quoted further](#) as saying that even if samples were provided, OPCW would never get involved in testing something that its own inspectors did not "gather in the field" because of the need to "maintain a chain of custody of samples from the field to the lab to ensure their integrity".

Following an [incident on 27 May 2014](#) in which despite having reached an agreement with the opposition the FFM convoy came under fire while travelling behind opposition lines to Kafr Zita and members of the team were "detained for some time" by gunmen, further visits to opposition-held areas were ruled out. The decision to continue the Fact-Finding Mission, implying that OPCW would now disregard its own precepts that they would not test samples provided by others or make a formal assessment of an alleged chemical attack without being able to visit the site, was made by the Director-General and subsequently [endorsed by the Executive Council of the OPCW](#). The FFM's conclusions that chlorine was used as a weapon in incidents from 2014 onwards were based on interviews, images, documents and samples provided by witnesses and NGOs and conveyed to the FFM outside Syria.

The work of the FFM was [criticized by the Russian Permanent Representative to the OPCW](#) who complained on 14 April 2017 that

Under the mandate defined for [the Fact-Finding Mission], its membership should be approved by the Syrian government, and it should be balanced. For some time, these provisions were observed somewhat, but then the mission

was split into two groups. One [Team Bravo], led by Steven Wallis from Britain, works in contact with the Syrian government, while the other one [Team Alpha], headed by his fellow countryman Leonard Phillips, deals with the claims filed by the Syrian armed opposition. This latter group is working completely non-transparently. Its membership is classified, and no one knows where it goes or how it operates. They are allegedly using the same methodology as Steven Wallis' group, but they are clearly working mostly remotely, relying on the internet and the fabrications provided by Syrian opposition NGOs, and never go to Syria. At least, we are not aware of a single such trip.

The FFM also used open-source material as evidence. The 2018 reports mention that media monitoring to identify this material was undertaken by the OPCW [Information Cell](#). [This unit](#) is headed by the Senior Communication and Information Officer [Lt-Col Leo Buzzerio](#) whose curriculum vitae includes three years as Deputy Division Chief in the US Defense Intelligence Agency. The FFM's reports do not describe their methods for retrieval and analysis of open source material, although methodology for conducting interviews and collecting physical evidence is described in detail. Links are listed in the appendix to each report, but there is no indication that any systematic analysis of this material was undertaken. Serious analysis of open source material entails tracing reports and images back to primary sources, geolocation and timing of images, ordering them in temporal sequence, and matching the identities of individuals in different videos or still images. When this is done carefully, clues may emerge. A model for this type of investigation is the analysis of the Douma videos [described by McIntyre](#), which reveals many troubling details: for instance that during the night some victims' bodies were rearranged and gold jewellery was removed.

Without on-site inspections, the credibility of the FFM's reports into alleged chlorine attacks depends critically on the organizations that identified purported witnesses and collected physical evidence. If OPCW inspectors as neutral observers could not safely travel in opposition-held areas, this calls into question the neutrality of those who could travel in such areas. Because this is critical to the credibility of the FFM's reports, this briefing note examines in more detail the organizations on which FFM Team Alpha relied to collect evidence.

Based on the devices alleged to have been dropped, the alleged chlorine attacks can be grouped into three phases:-

April to May 2014: chlorine barrel bombs

Following Syria's accession to the Chemical Weapons Convention in September 2013, no further alleged chemical attacks in Syria were [reported in mainstream media](#) until 2014. The [Third Report of the OPCW Fact-Finding mission](#) by Malik Ellahi dated 18 December 2014 covered alleged attacks using chlorine barrels during April and May 2014 in Talmenes, Al Tamanah and Kafr Zita. The data and material collected by the FFM included interviews, images and documents. The FFM concluded:

The Mission has presented its conclusions with a high degree of confidence that chlorine has been used as a weapon.

The Third Report of the FFM did not give any information on how the witnesses were identified, who arranged for them to travel outside Syria, or who provided the images and



documents. In an [earlier interim report](#) on the same incidents, the FFM had stated:

Independently of the individuals from the three villages who were interviewed, the FFM interviewed and received information from members of the “CBRN Task Force”, who had performed a systematic collection of data in the field following reported attacks in Talmenes and Kafr Zita.

A [biographical note](#) on Hamish de Bretton-Gordon (HdBG) states that he helped set up this CBRN [Chemical/Biological/Radiological/Nuclear(/Explosive)] Task Force.

Since the Syrian conflict started, Hamish has been deployed to the conflict area a number of times, where on behalf of OPCW (Organisation for the Prohibition of Chemical Weapons) he has helped set up a CBRNE task force.

In a [presentation to the Innovate UK Small Business Research Initiative](#) dated September 2014, HdBG (representing the now-liquidated company [Secure Bio](#) that he set up in 2011) indicated that this CBRN task force had been trained in Gaziantep in October 2013 and was based in Aleppo. He confirmed that it had provided evidence from alleged attacks in Talmenes and Kafr Zita to the FFM and also for a [story in the Daily Telegraph](#) published on 29 April 2014. He described his role further in a [talk to the All-Party Parliamentary Group Friends of Syria](#) in September 2016:

I have covertly been in Syria collecting evidence of chemical weapons attacks and have been giving it to the OPCW and the UN. They cannot get to the places the chemical weapons attacks have happened because they're in rebel held areas. When I present evidence with our teams from UOSSM, we are not an international body etcetera etcetera. We provided the evidence of the chemical weapons attack in a town called Talmenes in April 2014, on the 29th of April 2014, three weeks after the attack; two weeks ago, two years later, the UN Security Council announced to the world that they had conclusive evidence that the regime had attacked Talmenes in April 2014 with chemical weapons.

More information on the CBRN Task Force and its role in collecting evidence from alleged chemical attacks in Talmenes and Kafr Zita was given in an [article](#) by Houssam Alnahhas, described as the Local Coordinator of the CBRN Task Force of the Union of Medical Care and Relief Organizations (UOSSM). The affiliation of the CBRN Task Force to UOSSM was not described before 2016. The coverage of [UOSSM's press releases](#) appears to have changed abruptly in April 2016 from humanitarian work to allegations of airstrikes on hospitals and chemical attacks.

HdBG has described [to the All-Party Parliamentary Group](#) and [elsewhere](#) his covert role in collecting samples from alleged chemical attacks in Syria, and has stated that this role [dates back to March 2013](#). Press reports at this time described the collection of samples from these alleged chemical attacks as a [“covert operation involving MI6, the Secret Intelligence Service”](#) and as an operation in which [“MI6 played the leading role”](#). If these reports are correct, then it is reasonable to infer that unless there were two independent UK-led covert operations at the same time to collect environmental samples from the same incidents for analysis at Porton Down, HdBG's covert activity and the MI6 operation were one and the same. However admirable HdBG's activities (no doubt undertaken at considerable personal risk) may have been, neutral observers might consider it

inappropriate for the FFM to have relied on evidence gathered by a network set up by an agent of the intelligence service of a state committed to one side in the Syrian conflict. For clarity, we emphasize that the term “agent” is used here to denote [someone who undertakes covert activities on behalf of an intelligence service](#) but is not a member of that service.

#### Alleged attack in Talmenes on 21 April 2014

By comparing information from the three reports — the [interim report of the FFM](#), the [Third Report of the FFM](#), and the [Third Report of the OPCW-UN Joint Investigative Mechanism](#) (Gamba, Neritani and Schanze) — it is possible to reconstruct the role of the CBRN Task Force in providing evidence from this incident.

Annex 2 paragraph 3.5 of the Third Report of the FFM states that “The first interviewee provided his testimony and data to the Mission on 22 August 2014”. The first of three groups of interviewees from Talmenes, Al Tamanah and Kafr Zita reached the OPCW interview site on 25 August, so this first interviewee was evidently not a member of one of these groups. Table A in the Third Report of the FFM shows that the materials handed over by this interviewee on 22 August 2014 included sampling forms showing collection of materials including soil (from unspecified sites) on 12, 18, 21, 22 and 23 April 2014 and also “various videos [42 in number] taken by interviewee from the incident of 21 April 2014”. The Joint Investigative Mechanism reported that soil samples had been taken from this incident on 23 April 2014 and that the results had been published in a newspaper on 29 April 2014. From the quote given in the Mechanism’s report, this newspaper article can be identified as [Ruth Sherlock’s story in the Daily Telegraph](#) which described HdBG’s analysis of soil samples collected by the CBRN Task Force. From this we can infer that the person interviewed by the FFM on 22 August 2014, who provided the 42 videos from the incident in Talmenes together with documentation that soil and other samples had been collected, was representing the CBRN Task Force.

Although the environmental samples provided by the CBRN Task Force were not used by the FFM or the Joint Investigative Mechanism, the videos of the alleged impact sites in Talmenes were a key source of evidence for the reports. More details were given in the Joint Investigative Mechanism’s report. Two impact locations 75 metres apart near the main mosque in Talmenes were reported by witnesses to have been struck with chemical barrel bombs at around 10:30 to 10:45 h.

- The videos of Location 1 (numbered v02 to v05) showed a crater in a courtyard with dead animals and remnants of a barrel bomb. Analysis of these videos showed what the Joint Investigative Mechanism’s report referred to as “inconsistencies”, leading the Mechanism to disregard Location 1 for further investigation:
  - A forensic examination of videos v02 and v03 concluded that the crater had probably been made by a small explosive charge (5-10 kg TNT-equivalent) buried in the ground. “A barrel bomb without a large explosive charge would not penetrate the hard soil to the extent seen.” Use of a barrel bomb with explosives could be excluded as there was no shrapnel damage to surrounding walls.
  - The Mechanism noted that “the bodies of the dead animals seen in v04 look clean and intact, making it highly unlikely that they were in the backyard or at close vicinity when the device causing the crater

- detonated.”
- Metadata of video v04 included timestamps showing the creation date as 20 April 2014, one day before the alleged attack.
  - Videos v02 and v03 showed Location 2 also, with structural damage to a house and remnants of a barrel bomb. Gamba, Meritani and Schanze decided that “there is sufficient information for the Leadership Panel to conclude that the incident at impact location #2 was caused by a SAAF helicopter dropping a device causing damage to the structure of a concrete block building house and was followed by the release of a toxic substance which affected the population.”

As the Mechanism had identified [evidence of staging](#) at Location 1, we might have expected Gamba, Meritani and Schanze to be more suspicious of the story of a chemical barrel bomb strike at Location 2, especially since there was overlap of witnesses and videos from both alleged impact sites. As the “inconsistencies” identified by the Mechanism included the timestamp of video v04, this implicates whoever recorded these videos in the staging. As shown above, the source of these videos appears to have been the CBRN Task Force.

March to May 2015: permanganate barrel bombs

A new series of incidents allegedly involving chlorine began on 16 March 2015, ten days after the UN Security Council had adopted [Resolution 2209](#) condemning “in the strongest terms any use of a toxic chemical, such as chlorine, as a weapon in the Syrian Arab Republic” and resolving “in the event of future non-compliance with resolution 2118 to impose measures under Chapter VII of the United Nations Charter”.

Images from the sites of these alleged attacks showed refrigerant canisters and half-litre plastic bottles containing a purple substance that stained the surroundings pink. This substance was identified as potassium permanganate by the FFM, which suggested that it might have been used to produce chlorine by reaction with a “chlorine-containing compound”. The [Report of the OPCW Fact-Finding Mission in Syria regarding alleged incidents in the Idlib Governorate of the Syrian Arab Republic between 16 March and 20 May 2015](#) by Leonard Phillips dated 29 October 2015 covered six alleged attacks, concluding that

several incidents that occurred in the Idlib Governorate of the Syrian Arab Republic between 16 March 2015 and 20 May 2015 likely involved the use of one or more toxic chemicals — probably containing the element chlorine — as a weapon.

In relation to the alleged attack on 16 March 2015 in Sarmin, the Leadership Panel of the Joint Investigative Mechanism (Gamba, Meritani and Schanze) [concluded that](#)

There is sufficient information for the Leadership Panel to conclude that the incident at impact location #2 was caused by an SAAF helicopter dropping a device which hit the house and was followed by the release of a toxic substance, which match the characteristics of chlorine, that was fatal to all six occupants.

The Sarmin incident is examined in more detail in the [Appendix](#).

The FFM used open-source material from the internet as “supporting information”, but the methods for selection and analysis of this material were not described. Witnesses were identified and transported to “Country X” (presumably Turkey) by an NGO named the “Chemical Violations Documentation Center of Syria” (CVDCS). The FFM also received environmental samples and fragments of alleged munitions “collected by witnesses and/or representatives of the CVDCS”. Some of those interviewed by the FFM team were White Helmets. The CVDCS met OPCW in The Hague and in Brussels. The FFM explains why CVDCS was chosen as the provider of witnesses:-

While there were several different NGOs with access to potential interviewees, only one, the Chemical Violations Documentation Center of Syria, appeared to have access to the means of arranging their transport from the Idlib Governorate and their accommodation in Country X.

The CVDCS is [described on its website](#) as “an office within Same Justice” which was [founded as a not-for-profit association in Brussels on 7 April 2015](#). No accounts for this organization are available on the Belgian business register. The domain names [cvdcs.com](#) and [samejustice.com](#) were [registered](#) (on 11 March 2015 and 8 August 2015 respectively) by Hasan Addaher (sometimes transliterated as Hassan Aldaher), one of the founders of Same Justice who is also the co-ordinator of a [pro-opposition organization](#). As the FFM reports from 2015 onwards relied critically on Same Justice / CVDCS to provide interviewees and samples, we might have expected them to scrutinise this organization: how did it spring into existence in 2015, with an office in Brussels and a network on the ground in opposition-held Idlib able to collect samples, identify witnesses, and arrange for their transport and accommodation in Turkey?

March 2017 to February 2018: chlorine cylinders

Two later Fact-Finding Mission reports investigated alleged chlorine attacks in 2017 and 2018 in which the alleged munitions were ordinary gas cylinders, sometimes in a metal sleeve with fins. Environmental samples provided from both incidents showed chlorinated organic compounds and sarin degradation products. Possible explanations for these findings are discussed in the [Appendix](#).

For these investigations witnesses were identified through NGOs including CVDCS and the White Helmets. Samples were provided by the White Helmets, for whom the FFM uses the name “Syria Civil Defense” though Syria has a [civil defence directorate](#) responsible for firefighting and rescue. The reliance on the White Helmets for provision of evidence raises additional concerns. In many of the alleged chemical attacks from 2015 onwards, images showed that people dressed as White Helmets were present at the alleged attack sites or were filming the victims. To decide between the alternative hypotheses of a chemical attack or a staged incident, the FFM was relying on evidence provided by those who would be implicated if the hypothesis of a staged incident was true.

- [Report of the OPCW Fact-Finding Mission in Syria regarding an alleged incident in Saraqib on 4 February 2018](#) dated 15 May 2018:

The FFM determined that chlorine, released from cylinders through mechanical impact, was likely used as a chemical weapon on 4 February 2018 in the Al Talil neighbourhood of Saraqib

- [Report of the OPCW Fact-Finding Mission in Syria regarding alleged incidents in Ltamenah on 24 and 25 March 2017](#) dated 13 June 2018. The FFM attributed the sarin degradation products to secondary contamination from a previously unreported sarin attack the day before in which two munitions had allegedly fallen on agricultural land outside the town. The FFM concluded that “sarin was very likely used as a chemical weapon in the south of Ltamenah on 24 March 2017” and that “chlorine was very likely used as a chemical weapon at Ltamenah Hospital and the surrounding area on 25 March 2017”.

Witnesses of the alleged incident on 25 March 2017 reported that a gas cylinder dropped from the air had pierced the roof of the Ltamenah cave hospital, causing the death of a doctor. One of the witnesses interviewed by the FFM was described as a physician working at a nearby hospital that had treated victims of this attack. This individual is not identified, but the list of links included in the FFM’s report includes direct and indirect links to a [tweet](#) uploaded on 25 March by the [struck-off former doctor](#) Shajul Islam from a hospital that is purportedly treating patients from this attack, stating that “we think it’s sarin” and “our doctor Ali Darwish has been killed from treating the patients from this gas attack”. There is no indication that the FFM undertook any background checks on witnesses.

## Appendix

### *The alleged attack in Sarmin on 16 March 2015*

The alleged attack in Sarmin is the most widely-publicized of the alleged chlorine attacks. Excerpts from a video recorded in the emergency room of the Sarmin hospital were shown to a [closed meeting of the UN Security Council](#) on 17 April 2015, addressed by the doctor in charge of the hospital.

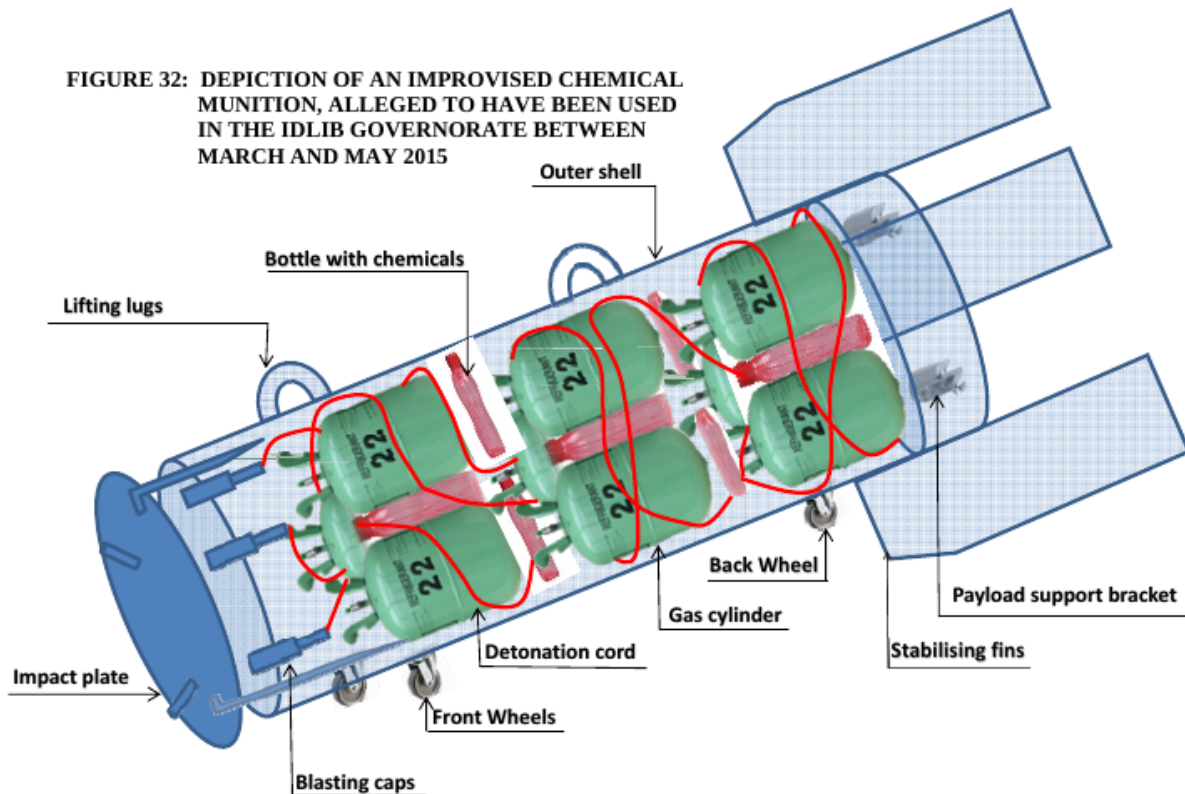
### *Alleged munition: a permanganate barrel bomb*

From the alleged site of this and other attacks, plastic drink bottles containing potassium permanganate and ruptured gas canisters labelled R22 (a non-toxic hydrochlorofluorocarbon refrigerant) were allegedly recovered. Potassium permanganate reacts with hydrogen chloride to produce chlorine. The [FFM report](#) obliquely suggested that this reaction (commonly used as a convenient way to prepare small quantities of chlorine in a laboratory) could have been used in a munition.

The samples and their analysis indicate the presence of potassium permanganate and a chlorine/chloride-containing chemical ... The vapour pressure of R22 is similar enough to that of certain other industrial chemicals, inter alia chlorine, anhydrous hydrogen chloride, and anhydrous ammonia, such that the refilling of R22 containers with other chemicals for use in an improvised bomb would be feasible ... Given the oxidising nature of potassium permanganate, it is conceivable that it might be used to oxidise a chlorine containing compound, resulting in the production of Cl<sub>2</sub>.



**FIGURE 32: DEPICTION OF AN IMPROVISED CHEMICAL MUNITION, ALLEGED TO HAVE BEEN USED IN THE IDLIB GOVERNORATE BETWEEN MARCH AND MAY 2015**



The FFM's reconstruction of the alleged permanganate barrel bomb: Figure 23, Annex 2 page 83 in the [report](#)

Though the leader of FFM Team Alpha is a chemical engineer, the FFM did not comment on the feasibility of such a device being used as a weapon. The plausibility of this device is open to question:-

- If for some reason it was intended to use chlorine as a weapon delivered by air, it would be simpler to drop cylinders of chlorine than to construct a device to produce chlorine by a chemical reaction at the point of impact.
- There is no mechanism for the potassium permanganate and hydrogen chloride to mix before the device is detonated. Binary chemical munitions are designed to mix the precursors in flight or before launch.
- Although the FFM had suggested that refilling of R22 canisters with other chemicals for use in an improvised bomb would be feasible, the Joint Investigative Mechanism's [report](#) noted that these canisters are disposable and that "their repurposing or refilling would require technical modification of the valve". No such valve modifications were reported by the FFM, which had been provided with canisters allegedly used in these munitions.

#### *Alleged delivery*

The device, reported to have an "approximate diameter of 1 metre to 1.5 metres", was alleged to have been dropped from a helicopter at about 11 pm and to have fallen down a ventilation shaft 1.5 metres wide from the roof of an apartment building to the basement apartment where the victims lived. A [satellite image](#) shows the ventilation shaft occupying less than 2% of the roof area of the building. Gamba, Neritani and Schanze accepted this



story, [adding](#) “improbable as it may sound”. The head of the Russian delegation to the UN General Assembly was more [sceptical](#):

Allegedly, in 2015, in the area of Sarmin town the Syrian government air force helicopter flying at a high altitude at night dropped a barrel with chlorine, which fell exactly into the ventilation shaft of an apartment building, almost of the same diameter. The [JIM] report recognizes that it “sounds improbable” and nevertheless the responsibility has been put on the government of Syria in spite of any common sense and the laws of ballistics.

Although [western](#) and [Russian](#) officials have stated that the Syrian air force does not have the capability to conduct air strikes at night, and the Syrian government had informed the Joint Investigative Mechanism that there had been no Syrian air force flights over Sarmin on 16 March 2015, Gamba, Neritani and Schanze [stated](#) that

the Mechanism obtained information from other sources, which corroborate witness statements of SAAF helicopter flights on the date and time of the incident.

Although the Joint Investigative Mechanism’s report devotes more than 2500 words to “Methodological considerations” and “Methods of work”, no information about these “other sources” is given.

#### *Hospital images*

[Two videos were recorded in a hospital emergency room](#) over a time span of about five minutes: [one bearing the logo of the the White Helmets](#) and the [other](#) a logo that includes the flag of the Nusra Front (the Syrian affiliate of al-Qaeda). These showed one adult and two children apparently already dead, and one boy about one year old who stopped breathing when he was laid on a trolley. No respiratory support was provided to this child. [Others have commented](#) on the inappropriate medical treatment of this child.

The children seen in the videos have [no signs of chlorine exposure](#): no red eyes and no signs of having coughed mucus or blood. The one-year old boy seen in the emergency room and in a [previous video](#) can be assessed on the limited evidence of these videos to have a reduced [level of consciousness](#) (does not open eyes, does not vocalize, and motor response to handling is minimal). This is consistent with an overdose of a drug such as an opiate causing respiratory depression, rather than chlorine exposure, as the cause of death. The doctor who addressed the UN Security Council described having personally attempted to save these children, but is [not seen in these videos](#).

#### *Suggestions that chlorine and sarin might be used as a mixture*

As noted above, several government and non-government sources had suggested that chlorine and sarin might have been used in combination in Douma.

An unexplained finding in the [Report of the OPCW Fact-Finding Mission regarding an alleged incident in Saraqib on 4 February 2018](#) was that the environmental samples contained not only chlorinated organic molecules, as would be expected if chlorine had been released, but also unchlorinated diisopropyl methylphosphonate (an impurity in sarin) and isopropyl

methylphosphonate (the main breakdown product of sarin). The FFM's only comment on these findings was this paragraph:-

The FFM also noted the presence of chemicals that can neither be explained as occurring naturally in the environment nor as being related to chlorine. Furthermore, some of the medical signs and symptoms reported were different to those that would be expected from exposure to pure chlorine. There was insufficient information and evidence to enable the FFM to draw any further conclusions on these chemicals at this stage.

Chlorinated organic molecules and sarin degradation products had been found also in samples from the alleged chemical attack on the Ltamenah cave hospital on 25 March 2017. The [FFM attributed this](#) to cross-contamination of the hospital by casualties from an alleged attack the day before in which two sarin-containing munitions were allegedly dropped on agricultural land outside the town. Environmental samples from the alleged incident on 24 March 2017 were not received by the FFM team until eleven months later, after the White Helmets had been prompted to provide them:

Based on information supplied during interviews, the FFM identified munition parts that were of potential interest in relation to the alleged incident of 24 March 2017 and arranged for their collection by an NGO. As a result, further environmental samples and remnants of alleged munition parts were received by the FFM team on 19 February 2018.

Surprisingly, despite the delay in obtaining these samples, they were found to contain intact sarin as well as sarin degradation products. The FFM does not comment on this. As no reports or images of the incident on 24 March appeared at the time, sceptics might doubt that it happened. A possible motive for fabricating the story of a sarin attack on 24 March 2017 could have been to provide an explanation for the anomalous finding of sarin degradation products in the samples provided in April 2017 from the alleged chlorine attack on 25 March.

In interviews [on the BBC](#) and [RT](#), the journalist Seymour Hersh indicated that he had seen a US intelligence report that expressed scepticism about the alleged use of chlorine as a weapon in Syria and noted that [a mixture of chlorine and sarin would not work because the sarin would be chlorinated](#)

All I can tell you is that the American intelligence community report - I wish I could flash it here - but the American intelligence community has been very clear that there's no evidence that the Russians, that the Syrians, the regime used a chlorine weapon because there is no such thing ... They [the US Army Chemical Corps] tested, in the Fifties, they tested chlorine with nerve agent to see how - whether the chlorine would soup it up. In fact what the chlorine did is it grabbed all the hydrogen molecules and diminished it. There's just no way you can use sarin and chlorine, as was written about all the time.

This [report](#) by Martin Chulov indicates that his source was aware that sarin cannot be mixed with chlorine.

"We're looking at the possibility that there were separate canisters inside the

cylinder,” said one regional official. “[The contents] cannot be mixed, because that would be volatile and unstable, but they can be combined. That’s a working theory – that they were in the same cylinder but kept separately. The point of detonation dispersed them together.”

No such cylinders with separate canisters have been reported from any of the alleged chemical attacks. We can find no published studies of the effect of dry chlorine on organophosphate nerve agents. If the conditions for chlorination (which include exposure to light or presence of impurities that could act as catalysts) were sufficiently favourable for other organic molecules to undergo chlorination, we might expect that sarin or its breakdown products would undergo chlorination. If the sources quoted above are correct, the finding of chlorinated organic molecules and unchlorinated sarin breakdown products in the same samples suggests that the sarin breakdown products may have been added later. This casts further doubt on the integrity of the process by which these samples were provided to the Fact-Finding Mission.

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