

Iraq's New War

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ABSTRACT: *There is metal contamination in Iraq in the soil around areas of heavy fighting, such as in the city of Fallujah, and there are reports of a wide range of congenital malformations and a shockingly high infant mortality rate. Some deem it unclear and whether these phenomena can be linked to the metal contamination. For example, many point to other known environmental and internal factors that can lead to birth defects, especially in Middle Eastern countries. However, such explanations cannot account for the high increase of birth defects, variances among cases, and the change in the sex ratio. Because of this, researchers name depleted uranium as the cause for the anomalies found in Fallujah. The radioactive nature of the metal, the widespread use of depleted uranium in Fallujah in 2004, and the metal's lasting effects support this conclusion. Government officials continue to deny the link between birth defects and the use of depleted uranium while others call for government action and seek innovative solutions.*

As Americans celebrated the end of the war in Iraq, many Iraqis were bracing for a new battle. In the last decade, physicians and residents of southern Iraqi villages witnessed an alarming phenomenon: there has been a large increase in congenital malformations. This leaves many to wonder what has happened in Iraq, how serious the situation is, and what could possibly be the cause. The literature and research suggests that the use of weapons by the United States in southern Iraq created a multitude of health problems due to the uranium that infiltrated the people's environment.

In 2004, the United States led an invasion into Fallujah in which the Iraqi city was bombarded twice with ammunition. According to Vlahos (2011), people in the area describe the city as being "practically obliterated" (p. 6) after the invasion. This depiction is supported in a study by the *American Conservative* reporting that "more than half of its 39,000 homes were damaged in Operation Phantom Fury" (Larison, 2010, p. 5). Given all of this destruction, Al-Sabback et al. (2012) point to research by Jergović to determine if a connection exists between the health problems and the ravaged state of Fallujah. In a collection of research evaluating war areas, Jergović, having analyzed regions for remnants of metals after fighting, "found significantly higher levels of metals in populations from areas with heavy fighting" (Al-Sabback et al., 2012, p. 938). Fallujah is the epitome of such a region, and now it stands to reason that metal contamination is a reality. The same article by the *American Conservative* reports congenital malformations in the region with 15 times the normal rate of birth defects (Larison, 2010). In consideration of these alarming data, Al-Sabback et al. (2012)

use a deductive approach to question whether the metal contamination from the heavy fighting is the cause of the unnatural increase in congenital malformations. Cognizant that irregularities and the presence of anomalies in any given environment can be potentially harmful to an individual, that exposure to pollutants can severely harm pregnant women, and that in cities with fighting, "severe contamination of water, soil, and air can occur" (Al-Sabback et al., 2012, p. 937), the authors contend that the increase in birth defects might be caused by metal contamination. Through a study evaluating hair, toenail, and teeth samples, 56 families participated in order for the researchers to evaluate if parents and children with the defects had been exposed to metals present in the ammunition and bombs used in the area. Mercury and lead are widely used in American weaponry, and the hair samples collected from Fallujah revealed lead "to be five times higher in the hair samples of children with birth defects than in the hair of normal children. . . . Mercury was six times higher" (Al-Sabback et al., 2012, p. 940). These results suggest a direct link between the metal contamination and the increase in birth defects.

As the research suggests, over the past few years, metal contamination has greatly influenced the Iraqi population and its children. The seriousness of the malformations, the great number of variances among cases, and how widespread the anomalies are amongst newborns is astonishing. Vlahos (2011) reports that "the litany of horrors is gut-wrenching" (p. 6) and describes a shocking list of malformations: "babies born with two heads, one eye in the middle of the face, missing limbs, too many limbs, brain damage, cardiac defects, abnor-

mally large heads, eyeless, missing genitalia, riddled with tumors" (p.6). The defects are depressing to hear about, even more so because they are so common. Vlahos (2011) continues, recounting a study by Fallujah General Hospital that in one month they "found that 15 percent of all 547 deliveries presented birth defects" (p.7) These numbers were similarly reflected in the previous four months. On top of the deformities, the study also reports "76 miscarriages, 60 premature deliveries, and one stillbirth" (Vlahos, 2011, p.7).

Not only are these children being born with deformities, but there has also been a considerably high infant mortality rate. An extensive study by a group of researchers found the mortality rate to be "80 [deaths] per 1000 live births in children" (Alaani, Al-Fallouji, Busby, & Hamdan, 2012, p.2). These distressing results are put into perspective when compared to other parts of the world. Alaani et al. (2012) compare the mortality rate in Fallujah to similar, near-by countries, finding "a figure of 17 in Jordan and 9 in Kuwait [per 1000 live births]" (p.2). Furthermore, Vlahos compares the high levels of deformities found to that of the United States and the worldwide average. The *International Journal of Environmental Research and Public Health* reported that "since 2003 'congenital malformations' were observed in 15 percent of all births in Fallujah in 2010. . . . By comparison, major birth defects affect only an estimated 3 percent of every live birth in the U.S. and an average of 6 percent of all births worldwide" (Vlahos, 2011, p.7).

Epidemic health problems have ravaged the city of Fallujah. Research shows that these numbers are consistent and growing. Dr. Ayman Qais, the director of Fallujah's General Hospital, "told *The Guardian* that he was seeing two affected babies a day, compared to two a fortnight in 2008" (Vlahos, 2011, p.6). Perhaps the only thing more alarming than the fact that these problems are increasing is the proliferation of contaminated areas. Vlahos (2011) continues, referring to a study by an internal Iraqi ministry that found "40 sites in the country that are contaminated with high levels of radiation and dioxins" (p.7). These regions are heavily riddled with toxins because of the war that took place there.

While evidence indicating a strong link between metal contamination due to weaponry and the increase in birth defects has been uncovered, the possibility of other contributing factors in Iraq must be considered. Vlahos (2011) explains that "Iraq is a quick study in environmental malpractice" (p.7) due to the improper disposal of waste leading to the infiltration of the water supply. The various environmental contaminants have

the possibility of contributing to birth defects. A survey conducted by the Iraqi Ministry of Planning and Development Cooperation along with the United Nations Development Programme in 2004 after the fall of Saddam Hussein's reign in Iraq provided crucial information and insight into the conditions of the people. After an examination of 21,688 households, "electricity shortages, poor sewage systems and a lack of clean water were overriding issues . . ." ("Iraq," 2005). The survey also found that "only 43 percent of those in rural areas had access to clean water compared to 66 percent in urban areas. . . . Nearly 63 percent of respondents were not connected to any sewage system, with those in rural areas being worse off." These conditions have an impact on the health of parents, mothers, and developing children.

Poor living conditions can also lead to maternal stress. Research examining possible causes for the health problems in Iraq contends that "stress may exacerbate risk in [a] population with poor nutritional status and meager economic resources. A recent study in Iraq reported exposure of Iraqi pregnant women to a high level of stress during the last two decades" (Al-Hadithi, Al-Diwan, Saleh, & Shabila, 2012, p.5). The survey taken in Iraq in 2004 not only revealed poor living conditions, but also that nearly a quarter of children aged between six months and five years were malnourished ("Iraq: Living conditions," 2005).

While external factors of environmental causation have been presented, others propose internal issues as part of explanation for the spike in birth defects: consanguinity. According to the World Health Organization (WHO), explains that consanguinity "increases the prevalence of rare genetic congenital anomalies and nearly doubles the risk for neonatal and childhood death, intellectual disability, and serious birth anomalies in first cousin unions" ("Congenital Anomalies," 2012). Though consanguinity is a known cause of birth defects in general, this is not the only explanation for the birth defects in Iraq. Consanguinity is a common practice in many Middle Eastern countries. Yet if this were the reason for the spike in birth defects in culturally Iraq, the high increase in affected infants would be reflected in similar countries such as Kuwait and Jordan. However, these countries do not share the same high levels of deformities and infant mortality.

Additionally, all studies done in Iraq have taken consanguinity into account with several other factors named by the WHO as being potential causes of deformities listed as: "maternal exposure to pesticides, medicinal and recreational drugs, alcohol, tobacco, certain chemicals . . ." ("Congenital Anomalies," 2012). In every re-

search study, information was obtained first to determine if a family would be suitable. In the study by Al-Sabback et al. (2011), “using a questionnaire, information on reproductive history of families and the parents’ siblings, residence history, health and disease during pregnancy, smoking and alcohol use, source of water for the family, and exposure to potential war contaminants was collected” (p.938). Also through a questionnaire, Alaani, Al-Fallouji, Busby, Hamdan, and Blaurock-Busch (2011) first “obtained the clinical details of the congenital anomaly, the age of the parents, their smoking history and alcohol drinking history and where they lived” (p.4). Therefore, families that had these health-adverse features were either excluded from the studies or knowledge of their past was taken into account when calculating results.

Environmental factors and actions taken by the parents are contributing factors to birth defects, but because of the seriousness of the malformations, the great variance among cases, and how widespread the anomalies are amongst the newborns, researchers conclude that the cause must be the extreme metal contamination. The situation in Iraq is becoming increasingly complex. Due to the various studies and reports concerning the congenital malformations, Alaani, et al. (2011) conducted their own experiment to determine the cause. Because depleted uranium (DU) is a product of many weapons, the authors started their research by examining the effects of DU which was used in Gulf War I. DU is a known potential cause of birth defects and cancer. Though there are variations in the studies, they found that the veterans of Gulf War I had children who showed an increased rate of congenital malformations. Also supporting the connection between the weapons and the defects is the increase of similar health issues in the Quirra polygon in Sicily where uranium weapons are tested.

Because of the increased rate of deformities in Gulf War I veterans’ children, the health issues in Sicily, and since it is the only known radioactive metal found in Iraq, the authors chose to focus on uranium as a possible cause for the problems. The researchers evaluated hair for uranium content. The results showed that parents of children with the anomalies possessed higher levels of uranium than that of what is normal for the area. They also examined long strands of hair and determined that at a certain length, one could find the level of uranium in the hair at the time of the attack. After doing so, it was clear that at the time of the heavy fighting and following it, the level of uranium excreted into the hair was abnormally high for the region and did not dissipate as would

be expected. The study proves uranium was in the weapons and is now contaminating the soil.

Moreover, because the anomalies are so widespread, and there has been a change in the sex ratio (“seen in the epidemiological study . . . an indicator of genetic stress” [Alaani et al., 2011, p. 2]), the nature of the health issues suggests a change in the genetics of the population. Uranium is the only element used in weaponry that is specifically known to be genotoxic; therefore, the negative health effects seen in Fallujah can be traced to uranium-based weapons not only because of the hair samples but also because it is the only explanation for the significant change in the sex ratio. Also supporting this finding was a study carried out by a group of researchers intending to evaluate the validity of previous epidemiological studies objectively. Over a period of 11 months beginning in November 2009, they researched the health problems at Fallujah General Hospital. The study reports that “. . . the genotoxic stress in Fallujah which led to the high cancer rates and sex ratio changes in the epidemiology study are supported here by the changes in the levels of congenital anomaly” (Alaani et al., 2012, p.6). They conclude that “some serious mutagenic exposure has affected and still affects the population of the town in 2010” (Alaani et al., 2012, p.6), and that future studies have been planned to investigate further.

With this strong evidence that uranium must be present in the soil, a focus is drawn to the innate qualities that uranium possesses. It is incontrovertible that depleted uranium is radioactive, and “the United Nations Environment Program (UNEP) has estimated that 1,000 to 2,000 metric tons of depleted uranium was fired during the 2003 war in Iraq” (Ludwig, 2013). In a recent study, researchers used a remote sensing technique to gauge the amount of radiation from uranium in twelve different sites across Iraq (Fathi, Matti, Al-Salih, & Godbol, 2013). The results revealed that “uranium in soils was determined at the different sites studied around Mosul city. A wide range of concentration of uranium was determined in the surface layer of soil” (Fathi et al., 2013, p. 19). This study extensively examines the radioactive nature of uranium and concludes that “contamination has spread widely in the air, soil and water, particularly as dust in windstorms” (Fathi et al., 2013, p.23). Peterson (2003) writes in the *Christian Science Monitor* about Latifa Khalaf Hamid’s produce stand that is “just four paces away from a burnt-out Iraqi tank, destroyed by – and contaminated with – controversial American depleted uranium bullets.” The radioactive dust lightly covers her produce and children

play on the radioactive debris, all completely unaware of the danger of their actions.

With all of these factors contributing to Iraq's health epidemic, what is the response? In 2011 Pentagon spokesman Michael Kilpatrick "told the BBC last year, 'no studies to date have indicated environmental issues resulting in specific health issues'" (Vlahos, 2011, p. 8). Another U.S. Defense Department spokesperson said, "We are not aware of any official reports indicating an increase in birth defects in Al Basrah or Fallujah that may be related to exposure to the metals contained in munitions used by the US or coalition partners" (Morrison, 2012, p. 2). From an objective stance, this may very well be true. Alborz (2013), writing on how to rebuild a post-war Iraq, notes that "regardless of the need for further investigation of the impact of potential sources of contamination on child health, there is a moral duty to remove such widespread likely threats to the well-being of future generations in affected localities" (p. 42). It is indisputable that DU was used and remains in the environment. The *International Journal of Environmental Research and Public Health* conducted a study evaluating the toxicity of depleted uranium through multiple tests and remarked that "uranium persists in the environment for extended periods and military use of this material will likely continue" (Briner, 2010, p. 308). Knowing that the problems will persist, what does the research suggest concerning what could be done? If the studies conducted prove to be valid and the United States recognizes them, how would the remedy manifest?

A study on the relationship between depleted uranium and fungi found that "all tested fungi exhibited high DU tolerance and were able to colonize DU surfaces" (Fomina et al., 2008, p. R375). Once this relationship was established, "aerobic corrosion of DU was facilitated by the fungal biofilms, which retained moisture on DU

surfaces . . . DU-colonizing fungi were able to overgrow DU corrosion products" (Fomina et al., 2008, p. R376). The fungi actually began to corrode the samples of depleted uranium, and after a 3-month incubation period, a significant weight loss of the depleted uranium sample was reported. The fungi are able to retain the uranium immobilizing the metal (Fomina et al., 2008). The researchers reported:

we have shown for the first time that fungi can transform metallic uranium into meta-autunite minerals, which are capable of long-term uranium retention. . . . This phenomenon could be relevant to the future development of various remediation and revegetation techniques for uranium-polluted soils. (Fomina et al., 2008, p. R376)

Therefore, if depleted uranium is plaguing the environment in Iraq, namely Fallujah, studies are pursuing different avenues for remedy.

It is clear that metal contamination has taken place, leading to a horrific array of congenital malformations; though, it remains a controversial issue whether these reports are valid, and has led many to turn to other known factors. But with continual, compelling research that these congenital anomalies can be explained through contact with uranium from U.S. weaponry, the U.S. government and innovative researchers have begun to search for answers. One thing remains certain: Americans will continue to celebrate the end of the war in Iraq, while many Iraqis will face the new battle of combating the results.

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