

Biological Warfare and the People of Iraq

The Anglo-American bombing of water supplies, sanitation plants, and the power plants that are necessary for their functioning, constitutes a biological attack.

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The only property of micro-organisms that enables them to be used as biological weapons is their capacity to cause infectious disease. People may be deliberately exposed to pathogenic micro-organisms in a variety of ways but it is the fact of exposure rather than the method of delivery that determines whether disease will result. Because the ability to cause infection is the defining aspect of a biological weapon, then any malevolent intervention that causes infection in the civilian population constitutes an attack with a biological weapon.

Micro-organisms are necessary but not sufficient in the causation of infectious disease and other causal factors are required for infection to occur.¹ Host resistance is an important factor in the chain of causation leading to clinical infection.² Whether or not exposure to a micro-organism causes disease depends on whether or not the exposed individual is susceptible or immune. Dietary deficiency of key vitamins and micronutrients increases susceptibility to a number of infectious agents and also increases the likelihood that infectious disease will result in severe illness and death. Vitamin A and zinc deficiency impair the ability of the immune system to fight infection and the ability of mucous membranes to resist infection.^{2, 3} Indeed, the decline in infectious diseases in high-income countries is more readily attributed to increased host resistance from better nutrition than to a reduction in the virulence of the relevant micro-organisms. It follows that any malevolent intervention that impairs the ability of a civilian population to resist infection constitutes biological warfare.

In public health practice, prevention involves removing one or more of the components in the chain of causation leading to disease. From an epidemiological perspective, causation and prevention are two sides of the same coin.¹ For this reason, a consideration of the actions that can prevent infectious disease from occurring after exposure to a biological agent can help to identify the other components in the causal chain. For example, following an attack with anthrax, spores can be washed off with soap and water and oral antibiotics can be given to prevent infection from developing.⁴ If an anthrax attack occurred in situations where antibiotics were unavailable then some cases of anthrax infection would be attributable to their absence. Consequently, any malevolent intervention that destroys a

population's ability to respond effectively to infectious diseases constitutes a biological attack.

These rather mundane scientific considerations have important implications for how biological warfare is defined in the context of the current conflict in Iraq. First, it implies that the Anglo-American bombing of water supplies, sanitation plants, and the power plants that are necessary for their functioning, constitutes a biological attack. Standard texts on biological weapons point out that three factors must be taken into account in selecting a biological agent for a biological attack: ease of manufacture, stability, and lethality. Despite widespread public concern about the use of anthrax, smallpox, and plague, all three are difficult to manufacture and disseminate. Anthrax requires sophisticated methods of manufacture and virulent stock is hard to find. The only confirmed sources of smallpox are in the US and Russia, and plague is both difficult to obtain and difficult to weaponize.⁴

On the other hand, the microbial agents that can cause devastating epidemics of diarrhoea are ubiquitous, lethal, and are readily disseminated by destroying the civilian sanitation infrastructure by bombing or otherwise destroying water sanitation and sewage disposal systems. These actions will ensure that food and water supplies to the civilian population will quickly become contaminated. Because the faeces of infected people will further contaminate the water supply and because there will be extensive person-to-person transmission this strategy has the potential to result in extensive, population-wide, and self-propagating epidemics. The scope for civilian casualties with such an approach is massive in comparison with the use of agents such as anthrax for which there is no evidence of person-to-person transmission. Declassified documents from the American Defense Intelligence Agency show that during the 1991 Gulf War, the 'Allies' deliberately targeted Iraq's water supply. Twelve years later, half the water treatment plants are still out of action.⁵

Second, the economic sanctions imposed by the United Nations Security Council that have caused widespread dietary deficiencies throughout the civilian population, seriously reducing the ability of the population to resist infection, constitute a form of biological warfare. Micro-organisms that pose little threat to those with intact immune systems can be highly lethal to those with impaired immunity as a result of micronutrient deficiency and malnutrition. For example, life-threatening diarrhoea can be caused by ubiquitous microbes such as *Escherichia coli* that reside in the gastrointestinal tract and common respiratory viruses can cause highly lethal pneumonia. As a result of the sanctions against Iraq there has been a more than doubling of the infant and under-5 mortality rates, with most of the excess child deaths being due to diarrhoea and pneumonia exacerbated by malnutrition.⁶ The imposition of economic sanctions in Iraq is as much a form of biological attack as was the distribution of anthrax in the US mail system.

Third, the destruction of the Iraqi population's ability to respond to outbreaks of infectious disease by restricting the import of essential medicines and medical equipment, by destroying the public health infrastructure, and by overwhelming the capacity of the healthcare system to respond effectively constitutes a further biological attack.

Fourth, having destroyed Iraq's water and sanitation systems, leaving the civilian population highly vulnerable to major epidemics of infectious disease, the failure to restore the public health infrastructure and provide safe water supplies to homes and hospitals constitutes a biological attack. In this context, recent reports that reconstruction contracts may be awarded to the US company Bechtel are a particular cause for concern. In 1999, a Bechtel

subsidiary took over the control of the public water system in Cochabamba in Bolivia and within weeks doubled and tripled the water rates for some of the poorest families in South America resulting in massive public demonstrations.⁷ Also, we must not forget that in the case of Afghanistan, despite the Bush administration's claim that 'the US will not walk away from the Afghan people', the administration subsequently forgot to ask for any money for humanitarian and reconstruction costs in its 2003 budget.

The full extent of civilian casualties resulting from the war on Iraq will become clear in the coming weeks and months. An effective humanitarian response must be mounted urgently to reduce the death toll from this appalling episode in the history of biological warfare.

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