

The Gulf War Syndrome

In support of United Nations resolution 660, a number of nation states sent troops to the Persian Gulf to liberate Kuwait following an invasion by Iraq on 2 August 1990. Just over five months later an air war was begun, followed 39 days later by a ground war that lasted just four days. The campaign took place initially in a hot and humid environment, then in a cold and damp one. Major sources of complaint during the campaign were the packaged food, lack of privacy, wooden latrines, and communal washing facilities. Levels of apprehension and stress were high during "Desert Shield" and fell after the outbreak of hostilities during "Desert Storm". Compared with other campaigns in recent decades combat casualties were low, as was the number of those affected by non-combat injuries and disease. The general health of the troops was good, however, a number of those returning from the Gulf have complained of a varied symptomatology (table 1), not localised to one organ system, without consistent physical findings or laboratory determined abnormalities, and without (thus far) identifiable links to any military component of the war, weapon or chemical exposure, or geographically localised risk factors.¹

The symptomatology identified in United States, United Kingdom, and Canadian veterans, at very different rates, has not been observed in Saudi, French, Egyptian, Syrian or Moroccan troops, nor in native Kuwaitis.

Studies of the health of those returning from the Gulf are difficult for a number of reasons. In the seven months between August 1990 and March 1991 the United States deployed 697 000 troops to the Persian Gulf of whom 7% were women; the United Kingdom sent 51 000 service personnel of whom 4% were women; and other nations supplied widely ranging numbers—for example, Denmark sent approximately 800 personnel. These data mean that there are clear methodological constraints on what can be done in the various cohorts that might be identified, and demonstrate that for most of the associations to be investigated only studies on the United States' cohort are likely to have statistical power, unless effects are large or affect the rates or mode of expression of rarely seen illnesses in a large proportion of those involved in the campaign.

Recent concerns about malformations in the offspring of veterans illustrate the difficulties surrounding a valuable clinical study. Very few women were in the Gulf and at risk of pregnancy; the number returning as veterans of childbearing age is also small. In order to study paternal

Table 1 Department of Veterans Affairs Persian Gulf registry: most frequent complaints (52 216 veterans)

Symptom	Percentage complaining
Fatigue	20.4
Skin rash	18.4
Headache	17.9
Muscle/joint pain	16.8
Memory loss	13.9
Shortness of breath	7.9
Sleep disturbance	5.9
Diarrhoea	4.5

effects in the United Kingdom servicemen, it would be necessary to: identify family practitioners for the relevant dependents (having obtained permission from the servicemen); obtain consent from wives or partners; and contact the practitioners and get appropriate responses from them to what may be demanding questions. Matching of age (maternal or paternal), previous reproductive history, and exposures other than those under investigation would not be possible in such a small cohort, therefore, case control studies, with their attendant problems, are all that would be possible.

Concerns have been expressed about exposures to depleted uranium, chemical and biological warfare agents, nerve gas prophylaxis, immunisations, and infectious diseases including Leishmaniasis, as well as smoke from the 605 oil well fires and other petrochemical compounds. For each of these, different patterns of exposure exist and only some are well documented—soldiers in the United States Army can be identified in terms of position on the battlefield with remarkable precision (square metre); other armies are uncertain of the position of whole units. The immunisation history of regulars and reservists differs and compliance with antinerve gas medication instructions was variable and difficult to quantify. Nevertheless, useful studies could be done and could place the illnesses of those affected by their time in the Gulf in an appropriate therapeutic context.

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1 National Institutes of Health Technology Assessment Workshop Panel. The Persian Gulf experience and health. *JAMA* 1994;272:391-5.