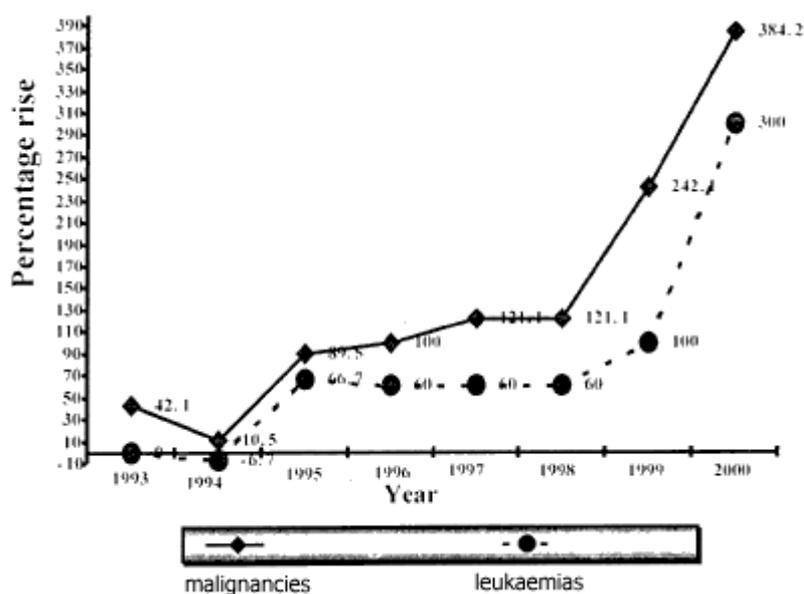


A summary of measurements carried out in Iraq by Iraqi scientists between 1996-2001

(i) Results of an epidemiological study in Basrah on children under the age of 15 show a marked rise for all malignancies from 1995 onwards (38 cases in 1995 to 92 cases in 2000), with corresponding figures for leukaemia of (25 cases in 1995 to 60 cases in 2000). The significance of this is that the noticeable rise takes place from 1995, i.e. almost after 4 years of exposure to the ionizing radiation of DU which is equivalent to the latency period of this type of malignancy.



(ii) Results established that contamination in Basrah was due to DU and not due to natural uranium.

(iii) Measurements in Basrah carried out in 1996 resulted in the following.

	Pre 1991 Measurements	1996 Measurements
Air	6-7 $\mu\text{R/h}$	92.1-184.5 $\mu\text{R/h}$
Soil		
Th-234	0	1830-62500 Bq/Kg
U-235	0	3.2- 1079 Bq/Kg
Ra-226	50-60 Bq/Kg	995-36250 Bq/Kg
Water Sediments	20-40 Bq/Kg	90-102 Bq/Kg

(iv) Measurements carried out in the location of one target destroyed in 1991 in Jabal Sanam in the Governorate of Basrah resulted in the following.

Ra-226 Concentration $\mu\text{g}/\text{sq.m}$	
1991	0.7
2000	8.32

Further Calculations led to:

Concentration of Ra-226 and Rn-222 in Air in Bq/cu. m			
	Pre Attack 1991	Post Attack 1991	Increase
Ra-226	4.44×10^{-6}	206	46 million times
Rn-222	15	1.5×10^5	10,000 times

(v) Measurements of radiation on the Saudi borders in the Governorate of Basrah ten years after the 1991 attack resulted in the following.

	Normal Concentration in Soil Bq/Kg	2001 Concentration in Soil Bq/Kg	Increase
U-235	BDL	675	
Th-234	24-42	34982	1000 times
Ra-226	30-40	19333	400 times

(vi) Drinking water in Baghdad, tested in 2001, ten years after the 1991 attack, gave rise to the following results, which are being compared to levels set by WHO and EPA [44].

Agency	EPA Bq/l	WHO mSv
Limit	0.185	0.1
Measurement in 2001	1.975	0.66

Alpha Emitters' Concentration is as compared to EPA Standard

Alpha Emitters' Concentration in ppm		
	Concentration	Deviation from EPA
EPA Standard	0.5	0
Water Station	0.705	40%

(vii) The rise of lung cancer in Babylon was monitored and compared for the same period before and after the 1991 attack

Period	Lung Cancer	Deaths
1985-1990	86	62
1995-2000	397	372

(viii) In the Governorate of Tamim north of Baghdad, hospital records of cancer and congenital anomalies were compiled for many years and compared for periods before and after the 1991 attack. One example of 2001 is compared to cancer and congenital anomalies (not classified per type) of 1989 as shown.

	Number in 1989	Number in 2001
Cancer	86	324
Congenital Anomalies	45	169

(ix) In the northern Governorate of Nineveh the following measurements have been reported

Exposure Rates and Ra-226 Concentration in Nineveh in 1999		
	Exposure Rate R/h	Ra-226 Concentration Bq/Kg
Normal	7	55
Mosul City	11.38	146
Nineveh Governorate	10.11	107

Estimate of body dose arising from these measurements led to:

ICRP Recommended Limit	Mosul City Dose 91-99	Nineveh Dose 91-99
1 mSv/year	214.24 mSv	18.62 mSv

(x) The incidence of malignancy among children below 15 in Nineveh was recorded for two similar periods of time before and after the attack

Children Malignancy	1983-1990	1991-1998	Rise
Mean Annual Incidence per Million	28	37	32%

The summary of the results of the studies carried out by Iraqis despite all the limitations created by the total blockade indicated the following:

- (i) There has been a sharp rise in incidence of malignancies and congenital abnormalities in the decade that followed the use of DU shells in the attack of 1991.
- (ii) Every district from the south to the north that was attacked with DU shells show elevated levels of radiation compared to those measured pre 1991.
- (iii) All elevated levels of radiation are higher, and sometimes extremely higher, than the limits prescribed by the international bodies responsible for the protection of people from excessive radiation.

Extract from: Al-Ani A.H., Baker J, *Uranium in Iraq: The Poisonous Legacy of the Iraq Wars*, vandeplas publishing, 2009