

THE AYATOLLAH'S NUCLEAR GAMBLE: THE HUMAN COST OF MILITARY STIKES AGAINST IRAN'S NUCLEAR FACILITIES

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ASSESSING THE HUMAN COST OF MILITARY STRIKES AGAINST NUCLEAR FACILITIES

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WHY THIS STUDY?

- Despite considerable debate over a military option, human costs and consequences have not received sufficient attention
- The Iranian government has not informed its people about potential casualties from attacks
- The human dimension is the most important element in the debate
- Rather than calling citizens “collateral damage,” the human consequences must be acknowledged

DETERMINISTIC VARIABLES

- Availability & *credibility of intelligence* to define order of battle
- Strategic *intent / military capabilities* of U.S. & Israel
- Timing, severity of *strikes, nature / number of targets*
- On-site conditions, *toxic inventories present, demographics, remediation capabilities*
- Preventive / *defensive actions taken by Iranian government & citizens*

DEFINITIONS/ASSUMPTIONS

- *Casualties*: Sum total of deaths, injuries, sicknesses
- Conservative casualty rates estimated between *5-20% of exposed individuals* in areas impacted by toxic plumes
- Military strikes using conventional bombs and munitions only
- U.S. National Institute for Occupational Safety & Health (NIOSH) limits for toxic exposure
- Ideal conditions without immediate effect of topography or cross-current air flows
- Average toxicity value as 25 ppm



METHODOLOGY

The study focuses on projected military strikes on sites near cities of Isfahan, Natanz, Arak and Bushehr.

Analysis of casualty results at these sites and vicinities using Gaussian plume modeling.

Projections based on the following sources of data:

IAEA,
publications from
research centers,
official statements
and documents

Theoretical
studies based on
scientific
modeling

Historical
experience with
comparable
scenarios
(Chernobyl,
Bhopal, Bam
earthquake)



KEY FINDINGS OF STUDY

- Iran's nuclear program is not an empty shell or single remote target
- Facilities are fully operational with hundreds of tons of toxic / radioactive materials
- Facilities are located near major population centers, heavily constructed and fortified, difficult to destroy
- Physical / thermal casualties will likely exceed 5,000 personnel at nuclear sites, secondary casualties could increase this to over 80,000 citizens

CASE STUDY: ISFAHAN



According to IAEA reports from 2004 to 2010, the Isfahan Uranium Conversion Facility (IUCF) has produced in excess of 371 metric tons.

City of Isfahan is less than 10 miles from IUCF; prevailing wind would blow toxic plume to suburbs within an hour.

If substantial stock of material is released upon military attack, vast amounts of toxic chemical will enter atmosphere.



URANIUM HEXFLUORIDE (UF₆)

- According to IAEA reports from 2004 to 2010, Isfahan IUCF has produced in excess of **371 metric tons** UF₆
- August 2012: New IAEA report increased this to **550 metric tons** UF₆

ISFAHAN PREVAILING WINDS

Month	Prevailing Wind Direction	Average Prevailing Wind Speed (meters/second)	Average Prevailing Wind Speed (miles/hour)
January	West	4.5	10.07
February	West	5.2	11.63
March	West	5.7	12.75
April	West	5.8	12.97
May	West	5.6	12.52
June	West	4.9	10.96
July	East	5.3	11.85
August	East	5.1	11.41
September	East	4.3	9.62
October	West	4.6	10.29
November	South-West	4.7	10.51
December	West	4.2	9.4

(Source: Isfahan Meteorological Office)

PLUME TRAVEL SCENARIOS: ISFAHAN

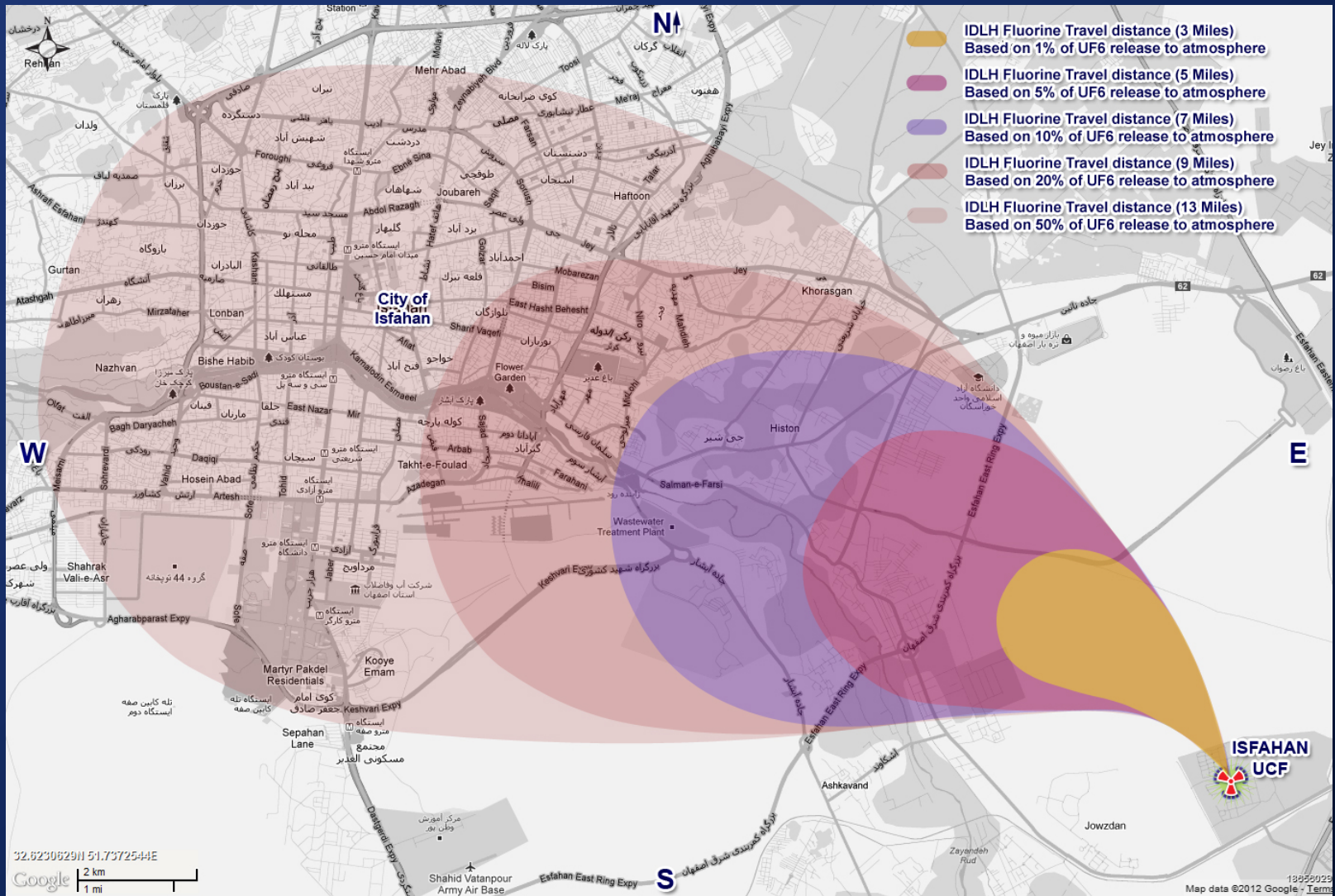


Chart Based on Release of 371 Metric Tons UF₆

ISFAHAN MUNICIPALITY'S DISTRICTS

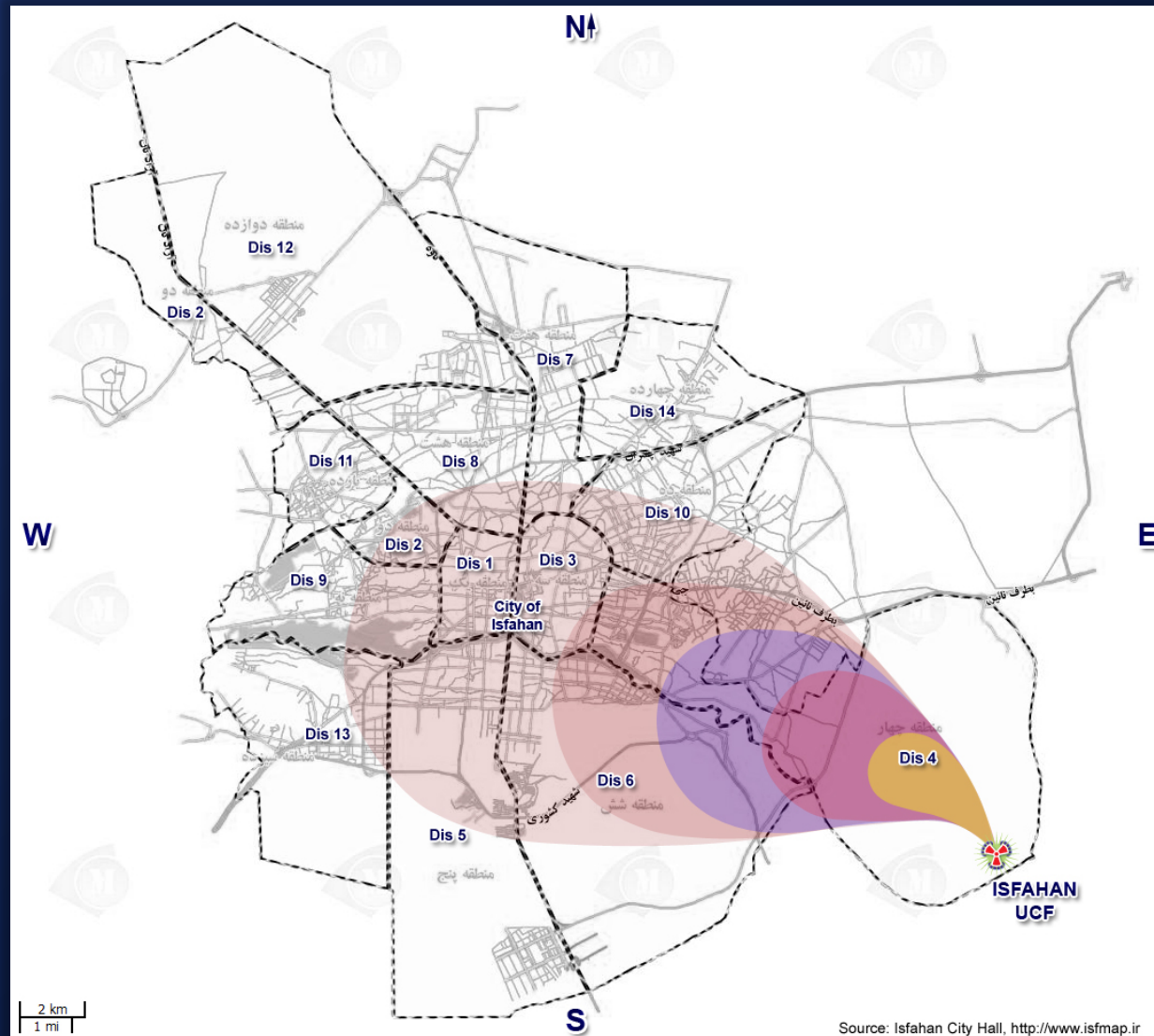
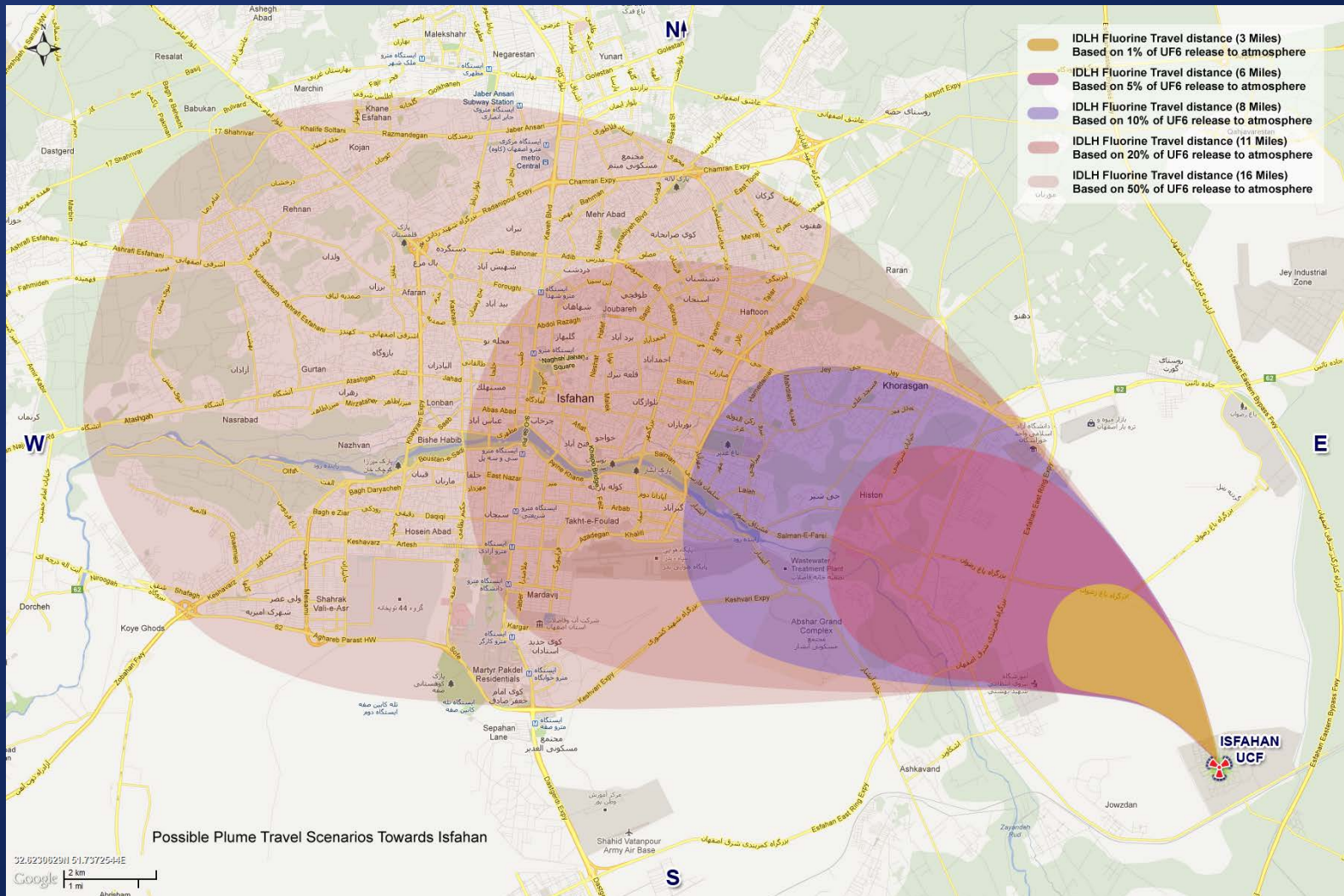


Chart Based on Release of 371 Metric Tons UF₆



PROJECTED CIVILIAN CASUALTIES: ISFAHAN

We assume a strike would kill the entire shift, approximately 800 to 1,000 people

With only 1% release of UF6 to the atmosphere, this plume will travel approximately 3 miles, covering a surface area of 5 square miles, potentially exposing 132,000 residents

If only 5% of UF6 stockpile at Isfahan goes airborne, toxic plumes could travel 5 miles and cover a surface area of 13 square miles; with prevailing wind this could expose 239,000 residents

District	2006 Population	2011 Estimated Population
1	73,926	74,153
2	56,028	59,834
3	111,816	111,950
4	119,455	132,725
5	144,963	165,272
6	107,871	107,956
7	135,854	166,568
8	205,437	248,782
9	69,321	71,943
10	189,976	215,836
11	56,246	65,230
12	105,312	148,786
13	109,101	125,705
14	139,532	166,670
TOTAL	1,624,838	1,861,410

Isfahan District Population (Source: Statistical Center of Iran, Population and Housing Census of 2006)



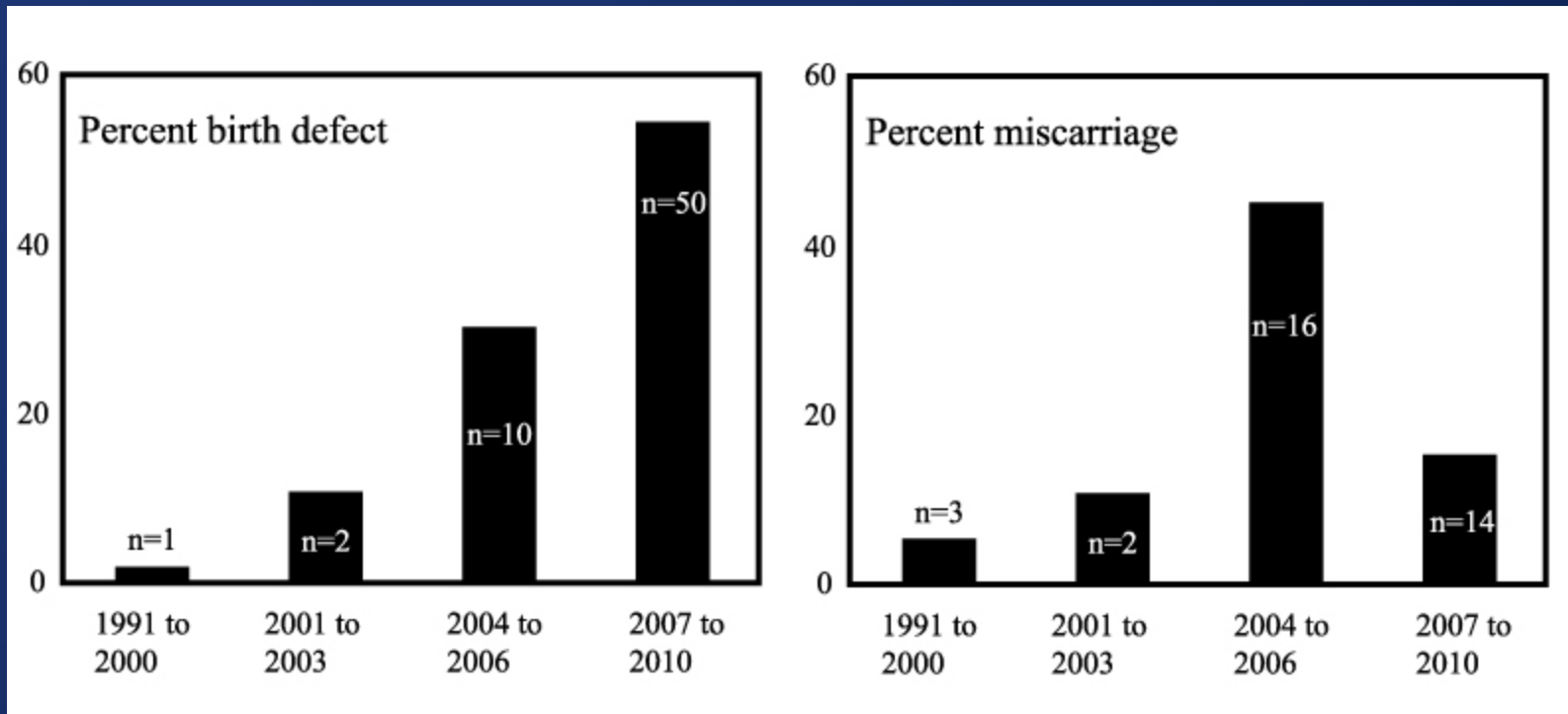
IRAN CIVIL DEFENSE CAPABILITIES

CIVIL DEFENSE TABLE*				
Location	Isfahan	Natanz	Arak	Bushehr
Air Defense	Iran Army Air Forces, Isfahan Base. Revolutionary Guard Air Defense, 10 Sky Guards Ineffective against strikes	Iran Army Air Forces, Isfahan Base. Revolutionary Guard Air Defense, 10 Sky Guards Ineffective against strikes	Iran Army Air Forces, Isfahan Base. Revolutionary Guard Air Defense, 10 Sky Guards Ineffective against strikes	Iran Army Air Forces, First base. Planned purchase of S-300 Missiles from Russia Ineffective against strikes
Civil Defense	Capable in general, but not capable of nuclear response	Capable in general, but not capable of nuclear response	Not capable, have some logistic capacity	Near full activation
Civil Defense Budget	\$20 million USD (Shared with Natanz)	\$20 million USD (Shared with Isfahan)	\$6 million USD	\$10 million USD
Hospital Beds	5,200 ¹⁷¹	71 ¹⁷²	1,033 ¹⁷³	590 ¹⁷⁴
Hazard Management	Poor	Poor	Poor	Moderate
Public Awareness	Poor	Poor	Poor	Poor

Note: Based on best available estimates and data

BIRTH DEFECTS IN IRAQ

- A new study entitled *Metal Contamination and the Epidemic of Congenital Birth Defects in Iraqi Cities*.
- In the case study of 56 Fallujah families, metal analysis of hair samples indicated contamination with two well-known neurotoxic metals: lead and mercury.



Percentage of birth defects and percentage of miscarriages among 56 Fallujah families who had come to Fallujah General Hospital for treatment or delivery between May and August 2010

SOURCE:

Metal Contamination and the Epidemic of Congenital Birth Defects in Iraqi Cities

**M. Al-Sabbak • S. Sadik Ali • O. Savabi •
G. Savabi • S. Dastgiri • M. Savabieasfahani
Published September 16, 2012**



<http://uprootedpalestinians.blogspot.com>



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CONCLUSION

- Iranian people lack an effective role in the nuclear debate. They need to be informed about human costs and consequences.
- Ending a war in the Middle East is much harder than starting one. Our strategic goal should be winning the hearts and minds of the Iranian people.

COVERAGE OF STUDY



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the GULF/2000 project

THINK
PROGRESS

Deseret News

THE VANCOUVER SUN

