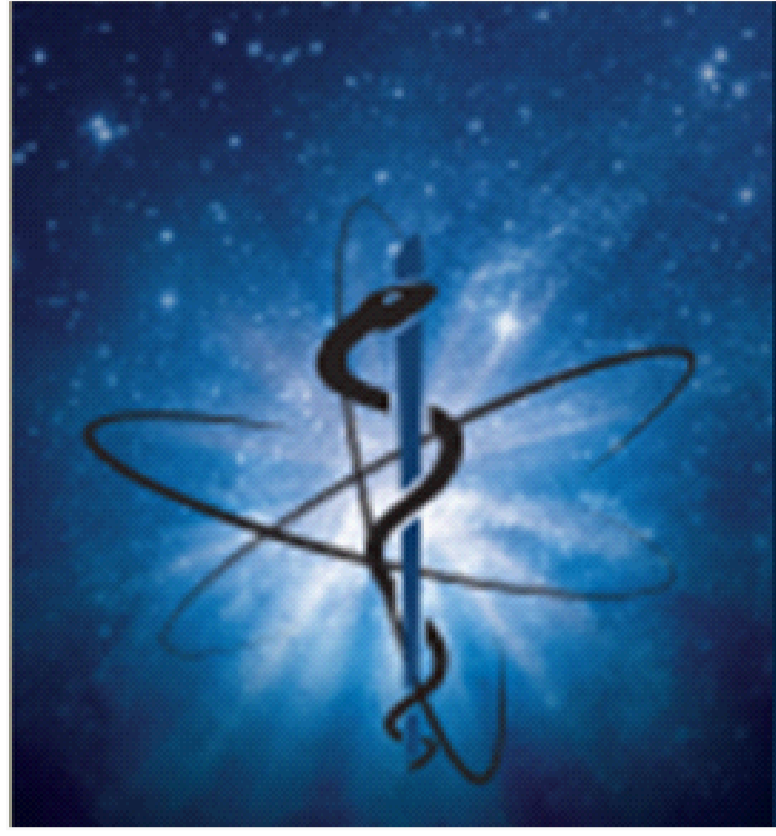


Quantitative Measurements of Uranium Isotope ²³⁶U in War Zones of Afghanistan



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PURPOSE

For almost two decades UMRC has conducted the quantitative analysis of the uranium isotope ²³⁶U together with the analysis of ²³⁴U, ²³⁵U and ²³⁸U in the urine of military personnel returning from Afghanistan and in local civilian populations.

METHODS

In all studies subjects were chosen by the following criteria: a) the onset of symptoms relative to the bombing raids; b) physical presence in the area of the bombing and inhalational exposure to the radioactive dust; and c) clinical presentation of the typical symptoms of uranium contamination. 24- hour urine samples were collected under controlled conditions. The environmental pollution of soil and water with uranium isotopes was also assessed.

RESULTS

A small detectable presence of man-made uranium isotope ²³⁶U was found in the urine samples of 8 symptomatic civilians from Eastern Afghanistan ranging from 2.16×10^{-6} to 9.53×10^{-6} % with an average of 4.82×10^{-6} % (SD 3.44×10^{-6}) while total uranium concentration in the urine samples ranged between 88.52 and 477.88 ng/litre with an average of 275.04 ng/l (SD 137.80 ng/l.).

CONCLUSION

The internal contamination with inhaled uranium has been demonstrated by the elevated urinary excretion of uranium isotopes of the civilian population in Afghanistan after the use of uranium containing weapons. The detection of ²³⁶U in the samples strongly suggests that recycled spent reactor fuel is part of the uranium weapons technology.

Picture 1



Map of Afghanistan

Picture 5

The Unique Signature of Artificial Uranium Compositions

Composition	" ²³⁸ U / ²³⁵ U Ratio"
"Natural" Uranium (NU) or Non-Depleted Uranium (N-DU)	137.88 + (²³⁶ U)
Depleted Uranium (DU)	492.60 + (²³⁶ U)

Unique Signature of Artificial Uranium Compositions

Picture 2



Dust Plume from Bomb Explosion

Picture 6

Ratio of Uranium Isotopes: "Signatures"

	²³⁸ U	²³⁵ U	²³⁸ U/ ²³⁵ U	²³⁵ U/ ²³⁸ U
Natural Uranium Composition	99.2739	0.7200	137.88	0.00725
Depleted Uranium (DU) / DU Shrapnel	99.7945	0.2026 <i>depleted re. ²³⁵U</i>	492.60	0.00203

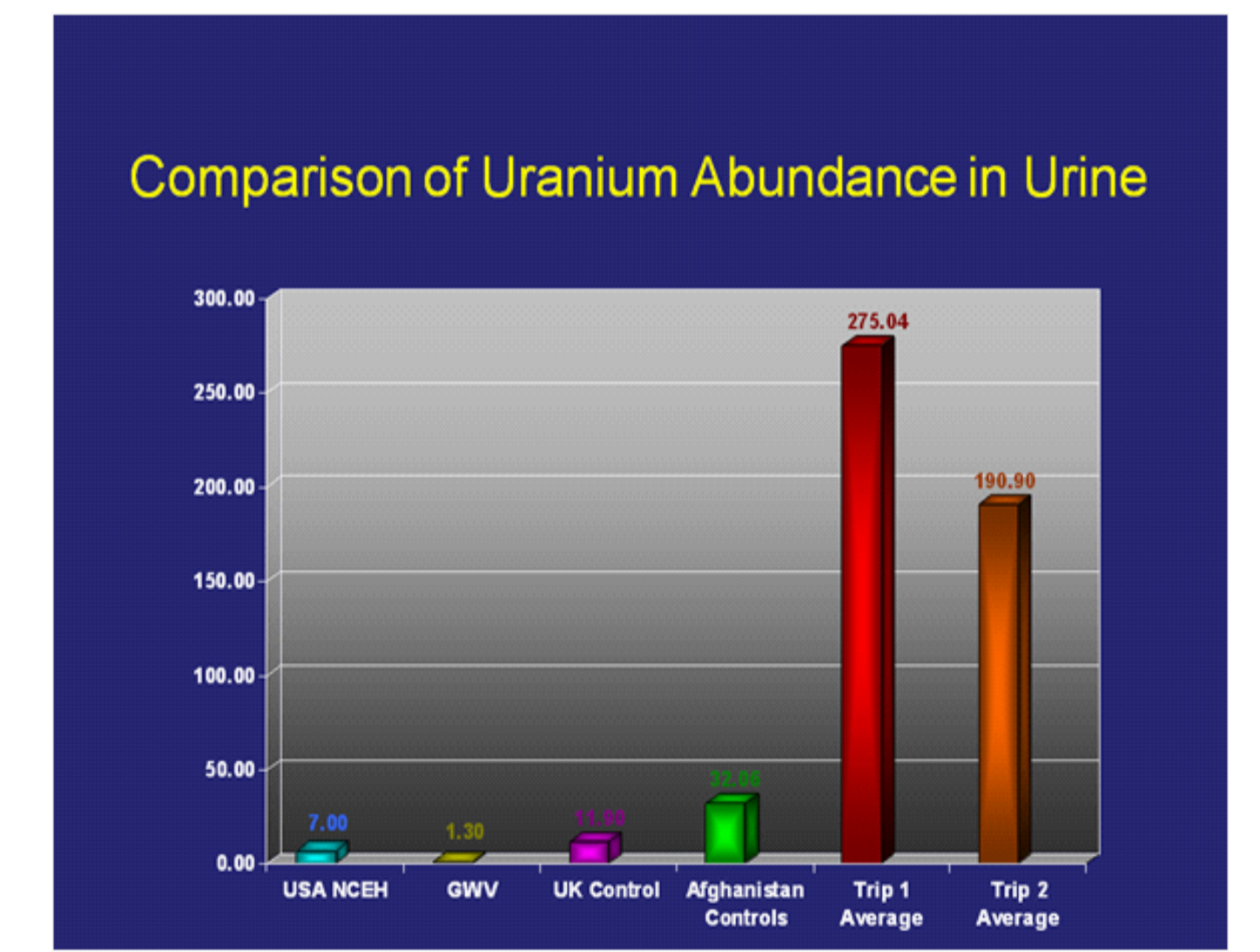
Ratio of Uranium Isotopes: Signatures

Picture 3



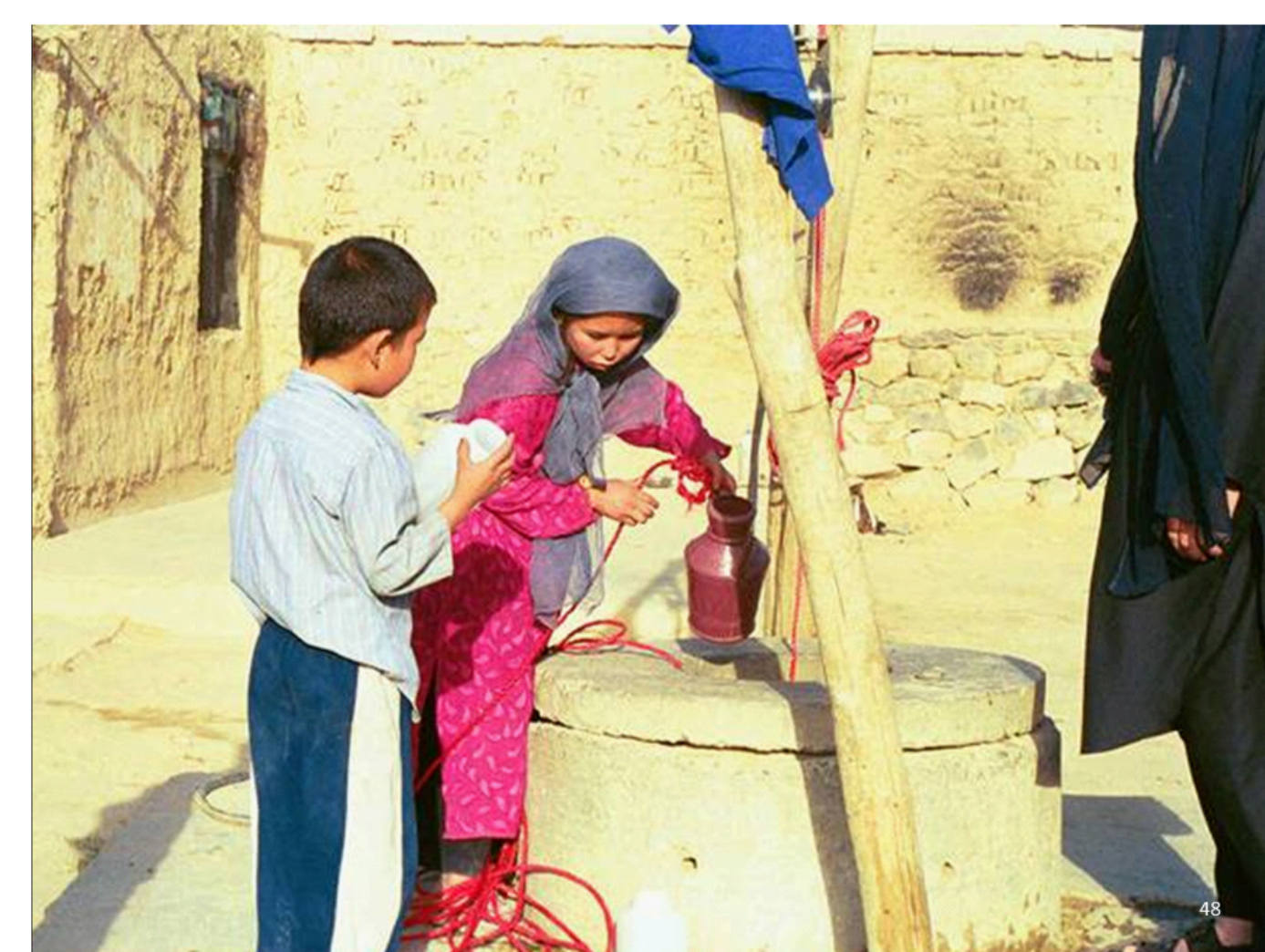
Water samples taken by UMRC field team, Afghanistan

Picture 7



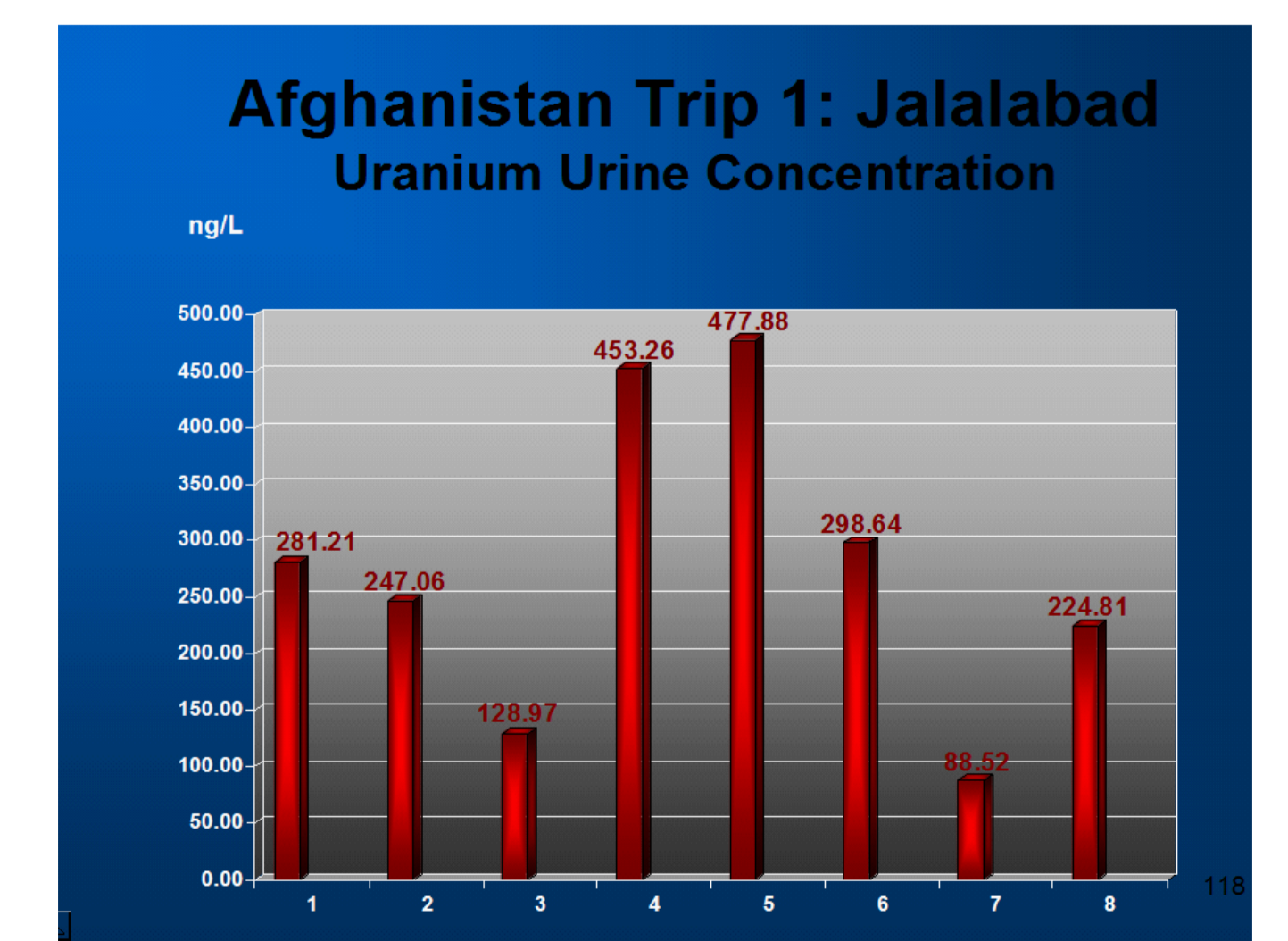
Comparison of Uranium Abundance in Urine Afghanistan

Picture 4



Children taking water samples, Bibi Mahro, Afghanistan

Picture 8



Uranium Urine Concentrations, Jalalabad, Afghanistan