

## **Thyroid diseases in the “Land of Fires”: results of a single center screening in Acerra (Naples)**

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**Introduction:** Environmental toxins, including those deriving from illegal and hazardous disposal of urban and chemical waste, are known to act as endocrine disruptors and to increase the risk of malignancy and cancer mortality. The present study aimed at investigating prevalence and characteristics of thyroid diseases in the area of Acerra, a town in the perimeter of the so called “Land of Fires”.

**Methods:** The screening included subjects aged 15 yrs living in Acerra. Overall, 787 consecutive subjects (631 F, 156 M, aged 39.6±16.3 yrs) were recruited on a voluntary basis. Iodine supplementation, thyroid palpation, hormonal testing (TSH, fT3, fT4, antithyroid antibodies), ultrasound and fine needle cytology (FNC, when necessary) were investigated. According to the age tertiles, subjects were classified as Group A (age <24 yrs, no=236), Group B (Age 25-52 yrs, no= 310) and Group C (age > 52 yrs, no=241).

**Results:** Prevalence of Hashimoto’s thyroiditis and nodular goiter was 13.5% and 17.5% of the whole cohort, respectively, being not different as compared to that of the Italian general population. Hashimoto’s thyroiditis was significantly prevalent in C compared to A (p=0.021), and hyperthyroidism in C compared to A (p=0.003) and B (p=0.03). Prevalence of nodular goiter was higher in C as compared to A (p<0.001) and B (p<0.001), and in subjects who did not use iodine supplementation (p=0.032) as compared to those who did. Among subjects undergone FNC, none had thyroid cancer and all were classified as benign nodular disease (THY2).

**Conclusion:** These findings suggest that subjects living in the area of Acerra had a similar prevalence of thyroid diseases as compared to the Italian general population and did not present with an increased prevalence of thyroid cancers despite chronic exposure to environmental pollutants.



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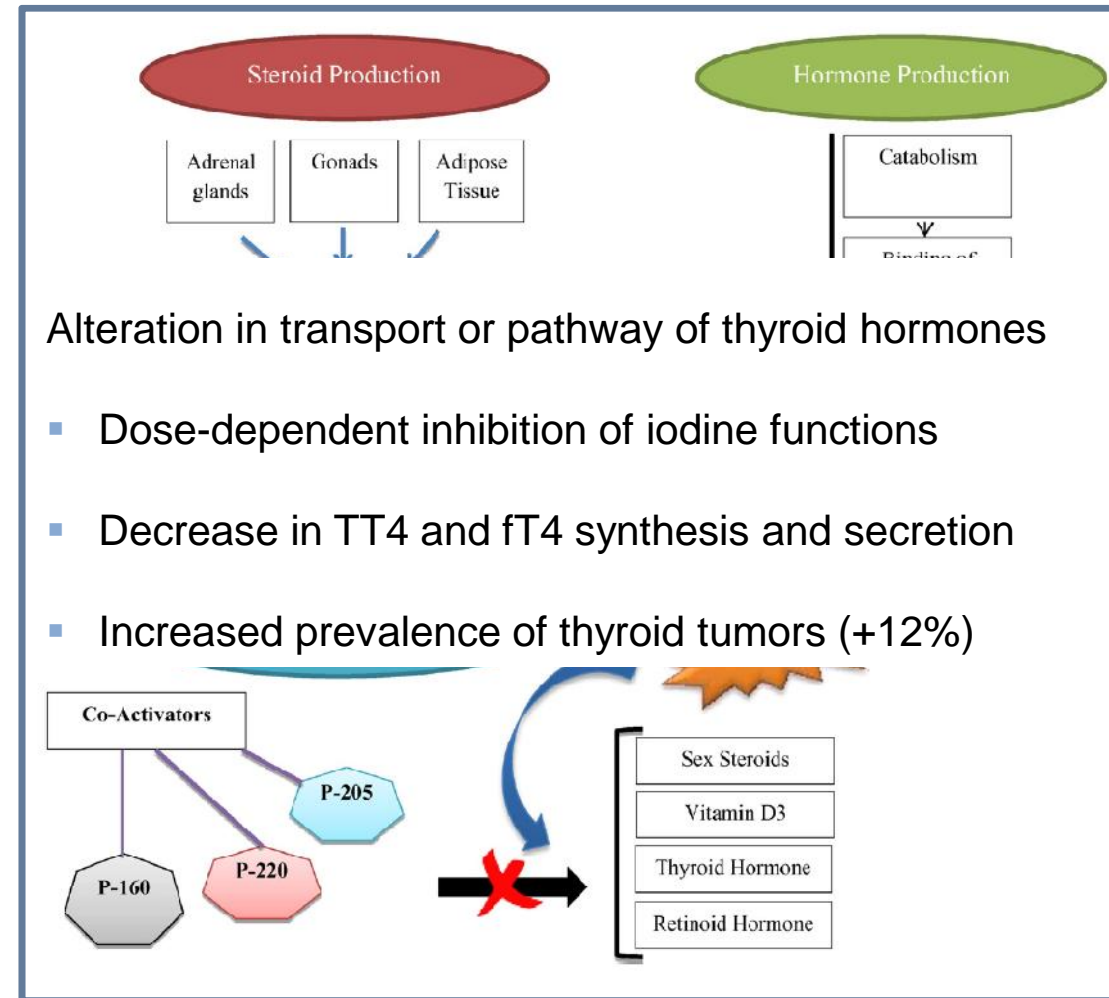
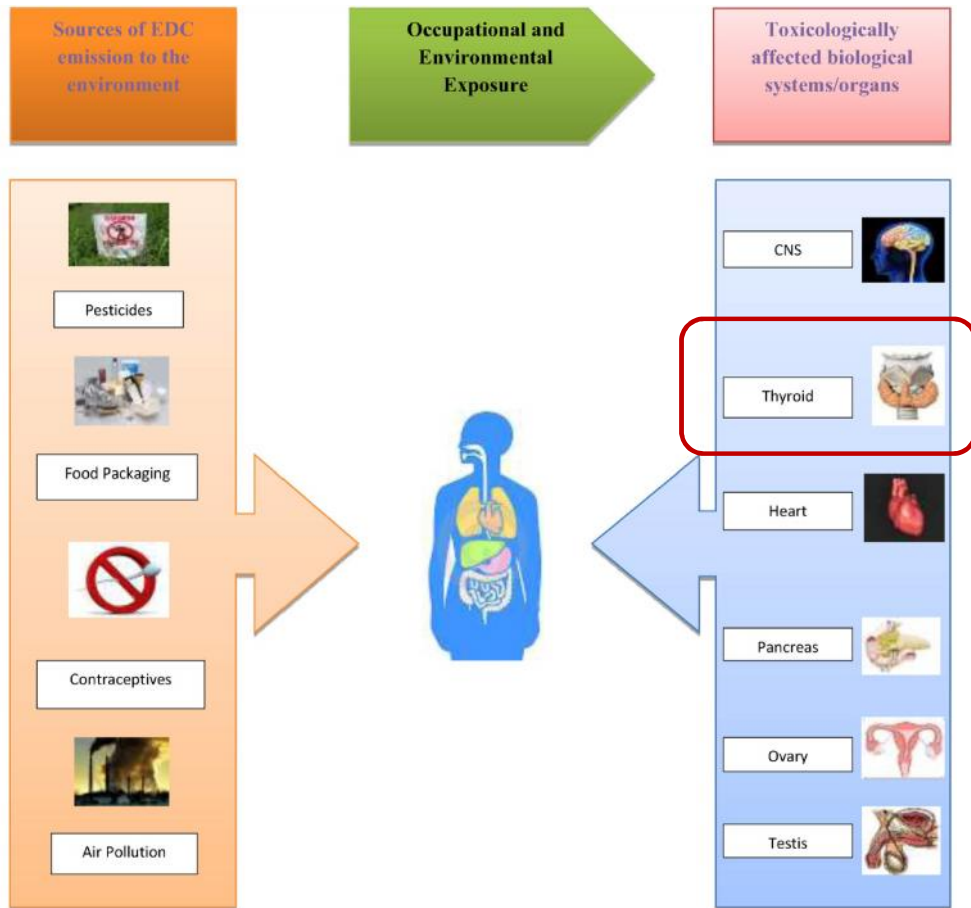
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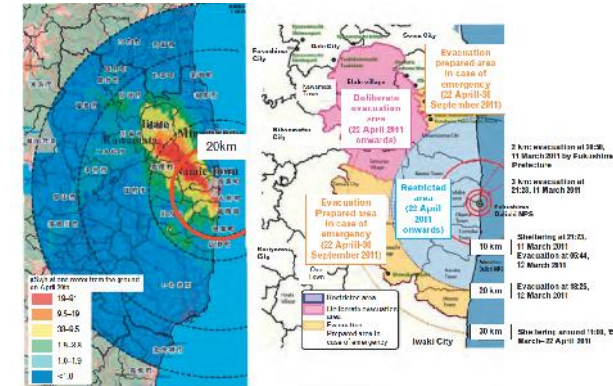
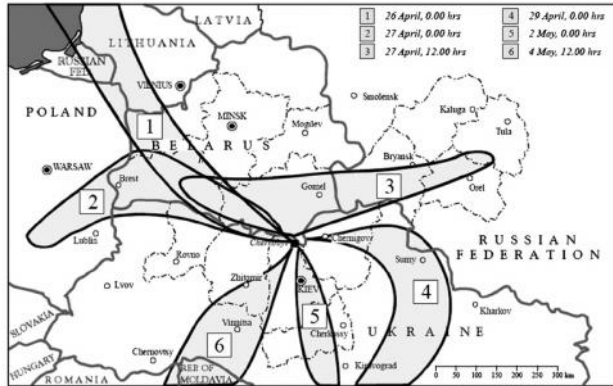
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# Endocrine disruptors and thyroid disease



# Lessons from Chernobyl and Fukushima

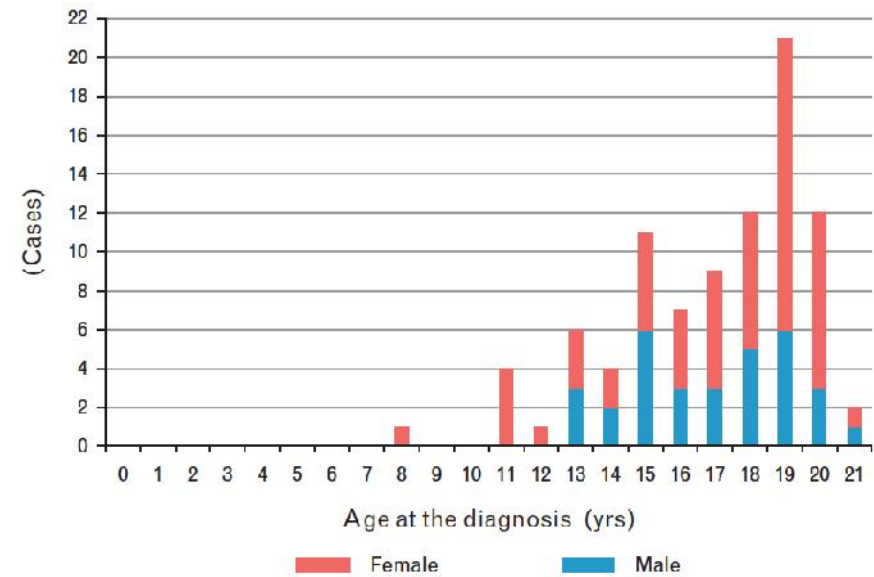


Age at exposure (yr)	No of Cases			
	Belarus <sup>1</sup>	Russian Federation <sup>2</sup>	Ukraine <sup>3</sup>	Total
0-14	1 711	349	1 762	3 822
15-17	299	134	582	1 015
Total	2 010	483	2 344	4 837

<sup>1</sup> Cancer Registry of Belarus, 2006

<sup>2</sup> Cancer subregistry of the Russian National Medical and Dosimetric Registry, 2006 (for the 4 most contaminated regions)

<sup>3</sup> Cancer Registry of Ukraine, 2006



World Health Organization, Report of the UN Chernobyl Forum Expert Group. Geneva, 2005  
 Nagataki S, Takamura N. Curr Opin Endocrinol Diabetes Obes. 2014 Oct;21(5):384-93





## Aim

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The present study aimed at investigating prevalence and characteristics of thyroid diseases in the area of Acerra, a town in the perimeter of the so called “Land of Fires”.

## Inclusion and exclusion criteria

- age 15 years;
- living in Acerra;
- written informed consent



- any mental condition making the subject unable to understand the nature, scope and consequences of the study, or evidence of uncooperative attitude;
- abnormal baseline findings or other medical conditions that, in the investigator's opinion, might jeopardize patient's safety or decrease the chance of obtaining satisfactory data needed to achieve the objective of the study;
- alcohol and drug abuse.

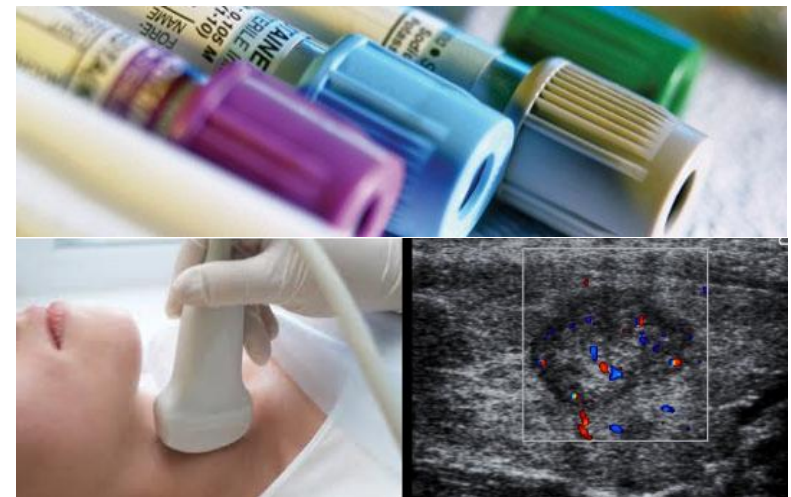
## Patients and methods

Between 2014, Oct the 1<sup>st</sup> and 2015, Dec the 31<sup>st</sup> 787 consecutive subjects (631 F, 156 M, aged  $39.6 \pm 16.3$  yrs) were recruited on a voluntary basis

- Iodine supplementation
- Height, weight, BMI, waist circumference
- Thyroid palpation
- TSH, fT3, fT4, antithyroid antibodies
- Thyroid ultrasound
- Fine needle cytology (FNC) when necessary

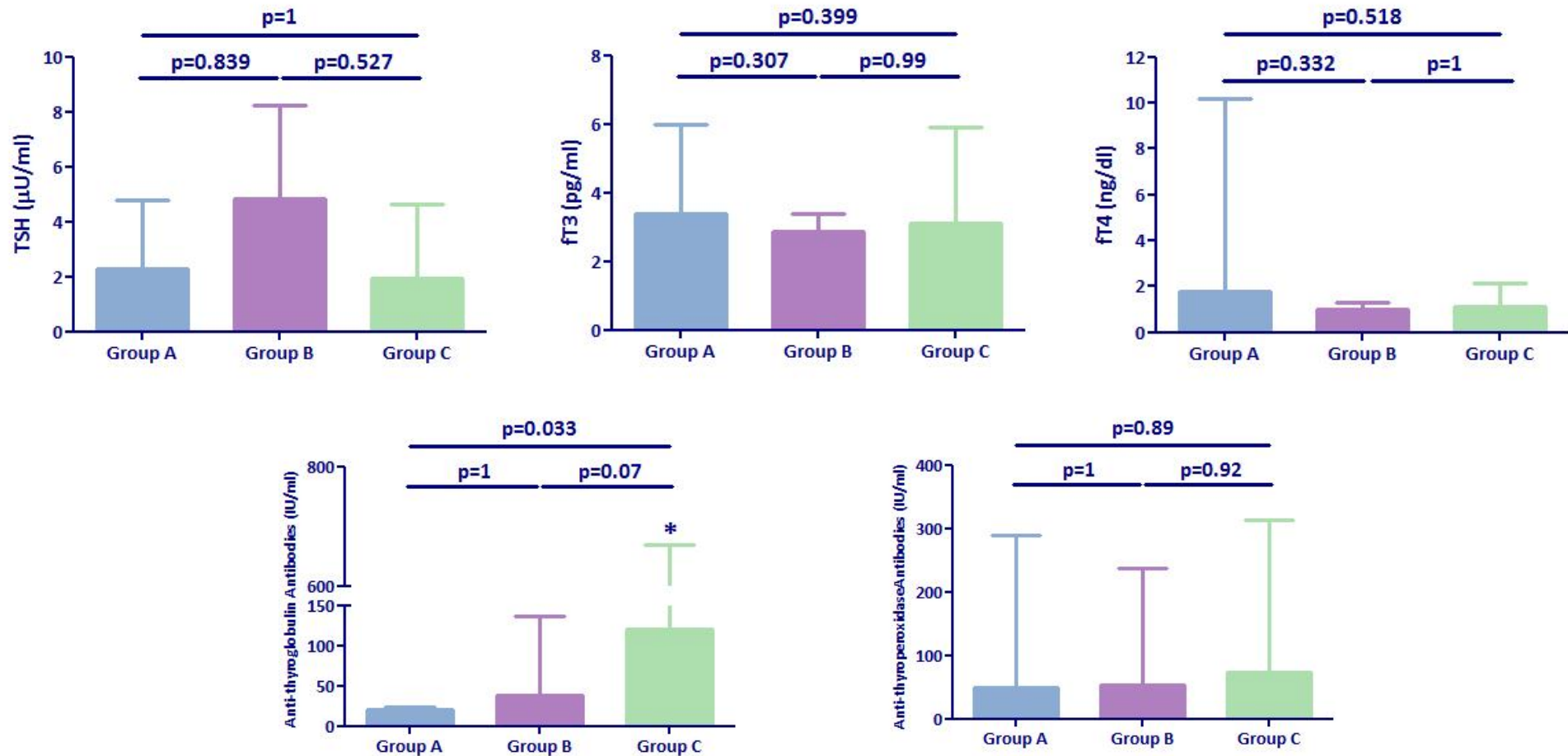
According to the age tertiles

- Group A = age <24 yrs (no=236)
- Group B = age 25-52 yrs (no= 310)
- Group C = age > 52 yrs (no=241)

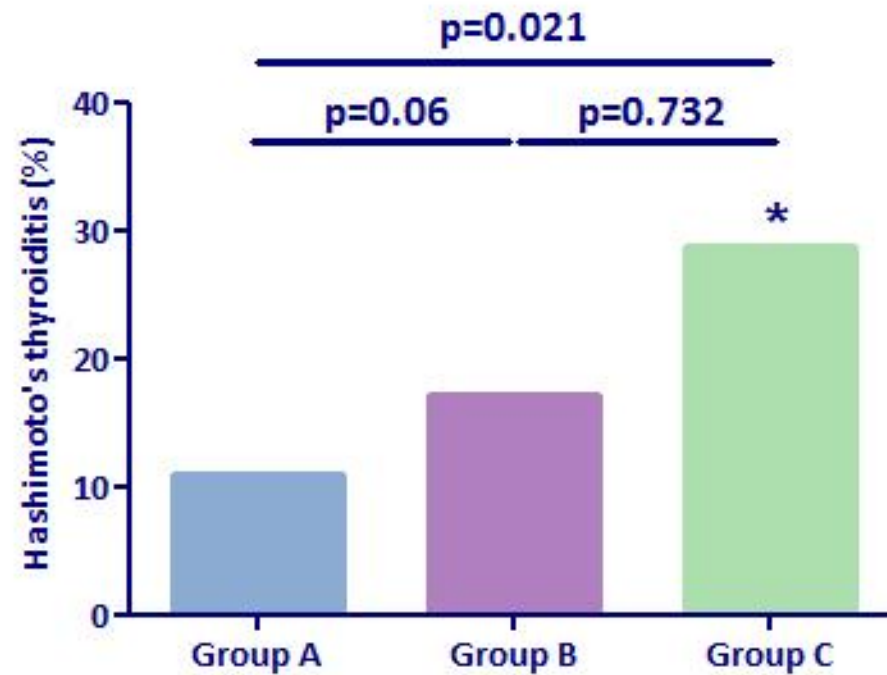




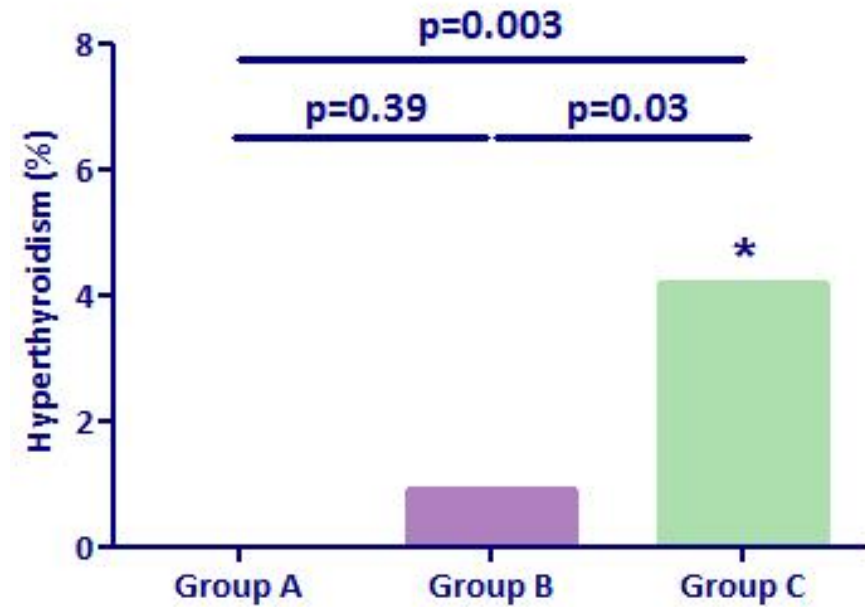
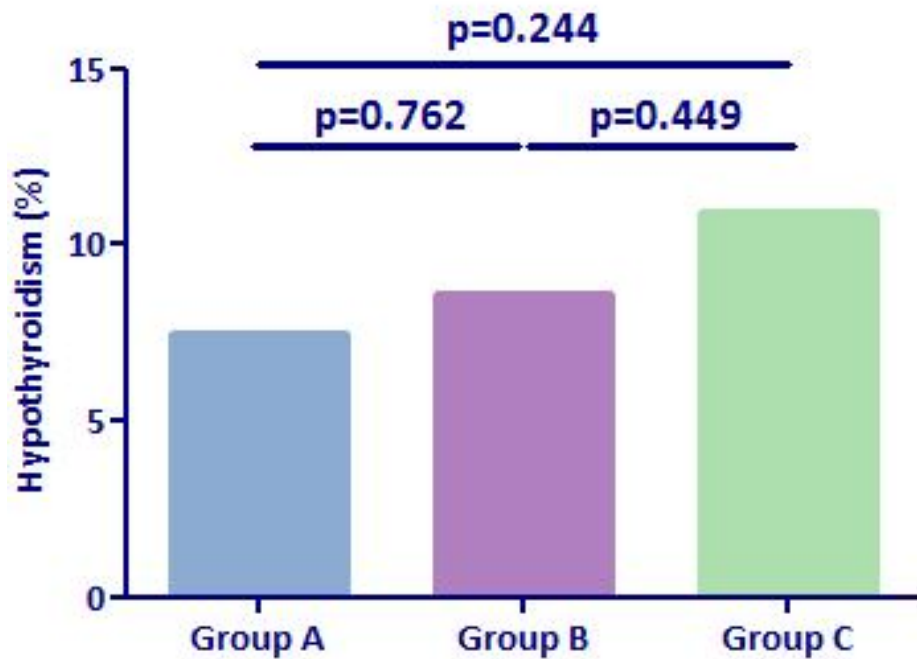
## Results: Comparison of hormonal levels among groups



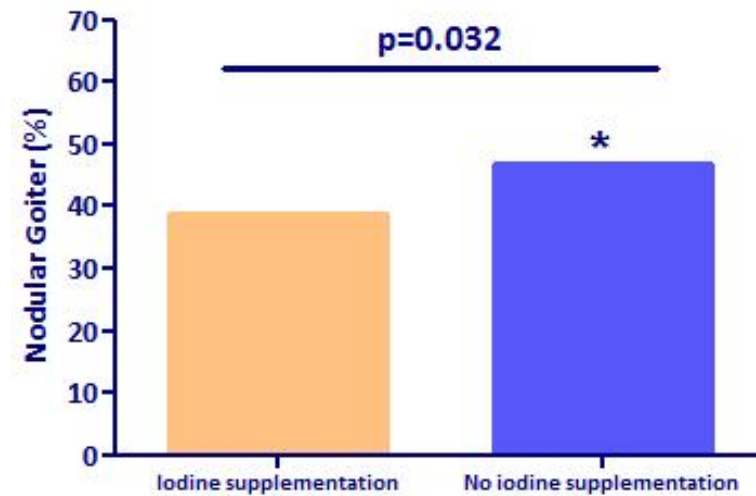
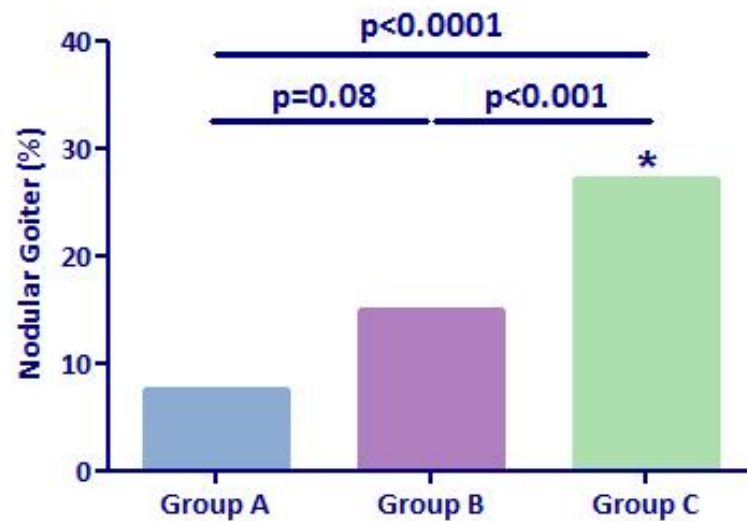
## Results: *Prevalence of Hashimoto's thyroiditis across groups*



Results: *Prevalence of hypothyroidism and hyperthyroidism across groups*



## Results: *Prevalence of nodular goiter across groups*



Among subjects undergone FNC, none had thyroid cancer and all were classified as benign nodular disease (THY2)

## Conclusions

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- Subjects living in the area of Acerra had a similar prevalence of thyroid diseases as compared to the Italian general population and did not present with an increased prevalence of thyroid cancers despite chronic exposure to environmental pollutants.
- Further studies are still needed to confirm and extend these data, better elucidating the burden and the role of environmental pollutants as endocrine disruptor in the “Land of Fires”.





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THANK YOU