

# MERCURY LEVELS IN SHARKS CONSUMED IN TRINIDAD

By  
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## Why are Mercury levels important to the region?

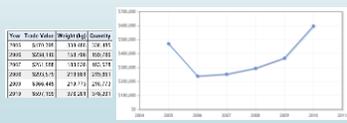
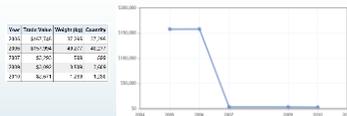
- We Love Seafood!
  - Global Consumption of Seafood 16.4kg/year
  - Regional Average Consumption 31kg/year
  - As high as 69kg/year in some islands.
  - Trinidadians consume canned fish 1/week and fresh fish 1/week on average.
  - Fresh Fish - Snapper, Mackerel Croaker and Shark
  - Canned - Tuna and sardines



## Why are Mercury levels important to the region?

### Trinidad is Shark Country!

- Trinidad and Tobago is the largest consumer of Shark in the region
- Trinidad's export of shark have fallen whereas imports have risen
- Shark consumption is on the rise!



## Why are Mercury levels important to the region?

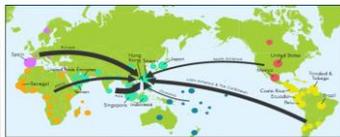
**CARIBBEAN PEARL SHARK STEAKS RECALLED**

13 MAY 2014

**NORWAY** - Bera Fisheries is recalling Caribbean Pearl Shark Steaks because the product has been detected with exceeded levels of heavy metals arsenic and mercury. The product was sold in stores in Bergen, Oslo and Trondheim. The recalled product is Caribbean Pearl Shark Steaks, Lot 373, ...

Shark exported to Norway recalled in May 2014. Reported high levels of Mercury

## Why are Mercury levels important to the region?



Trinidad banned Shark Finning and Exportation in 2014.

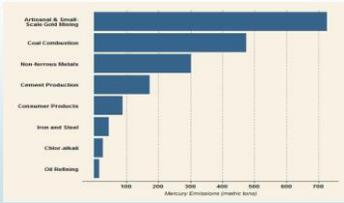


## Why are Mercury levels important to the region?

- Other factors
  - Religious Beliefs – 18.1% Roman Catholic
  - Fish as a healthier alternative – lower in fats, rich in omega 3 and proteins.
  - Growing trends – Sushi's popularity among young persons in Trinidad.

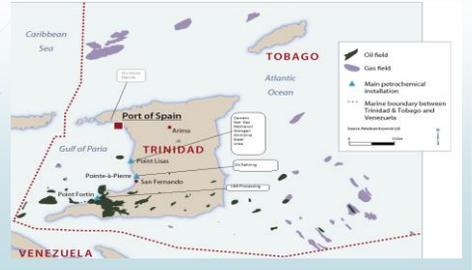


### Sources of Mercury in the Region

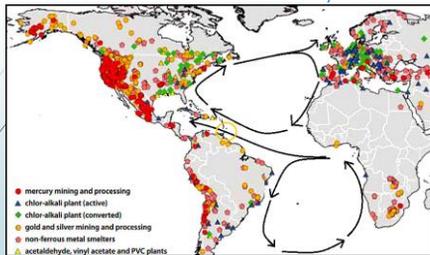


Source: United Nations Environment Programme (UNEP), Global Mercury Assessment, 2013

### Internal Sources of Mercury



### External Sources of Mercury



Map by D. Kocman, Jozef Stefan Institute (Kocman et al. submitted).

### What research have been done?

**Sediment**

- Noville et al. 2005 - Hg levels range from 0.2-99.7 ug/kg
- Rojas Astudillo et al. 2005 - Hg levels range from 360-1600ug/kg
- NOAA Threshold Effect Level (TEL) - 130 ug/kg

**Ecology**

- Balowski et al. 1999 - High levels of Hg in Feathers of Scaup Ibis
- Rojas Astudillo et al. 2002 - Hg levels in Green Muscle 30-170 ug/kg
- Balfour et al. 2012 - Hg in shrimp - low levels.

**Human Health**

- Pinto Pereira and Teelucksingh 2002 - Fish Faddism causing low-level mercury poisoning in the Caribbean - two cases.
- Neupane 2010 - Mercury Contamination in Tobago, West Indies. Hg in hair >1000ppb
- Prayaga et al. 2010 - Mercury Pollution from Dental Amalgam Waste in Trinidad and Tobago
- Bickett et al. 2016 - assessment of fish consumption and mercury exposure among pregnant women in Jamaica and Trinidad and Tobago.

### Current Research

- Two popular shark species were evaluated
- These were based on frequency of consumption and availability.

Puppy Shark (Atlantic small tail shark)	Hammer Head Shark (Scalloped)
<i>Carcharinus porosus</i>	<i>Sphyrna lewini</i>
1.1m (adult)	1.5 - 2.5m (adult)
	

### Current Research

- Mercury levels in shark tissue

Tissue	Puppy Shark (ug/kg) - 12 units	Hammer Head Shark (ug/kg) - 10 units
Muscle	208-1900	120-3328
Fin	302-1466	67-2368
Liver	74-477	98-765
Vertebra	54-274	110-1425
Size Range	53-62cm (juvenile)	81-135cm (juvenile)

- FAO/WHO limit is 1000ug/kg

### Current Research

- The provisional tolerable weekly intake (PTWI) is the acceptable level of toxic metal that can be ingested on a weekly basis, as determined by the WHO/FAO.
- For Mercury its 1.6ug/kg Body Weight
- PTWI Calculated – Assuming a 272g serving size

$$\frac{\text{amount of fish ingested per week} \left( \frac{\text{Kg}}{\text{week}} \right) \times \text{mercury concentrations in the fish ingested} \left( \frac{\mu\text{g}}{\text{Kg}} \right)}{\text{Kg body weight}}$$

Species	PTWI Calculated (ug/kg BW)	FAO/WHO PTWI Limit (ug/kg BW)
Puppy Shark	3.46	1.6
Hammer Head Shark	2.45	1.6

### Ongoing Research

- Updating of Consumption Patterns for Various Fish Species in the Region.
- Evaluation of mercury levels in commonly consumed fishes in the region
- Mercury uptake rates from ingestion of contaminated fish
- Methods of reducing mercury absorption in the human body
- Estimation of mercury loading in landfills from sources such as fluorescent light bulbs and batteries.
- Evaluation of mercury levels in fishing communities in Trinidad and Tobago by the use of hair samples
- Evaluation of mercury levels in coastal and scavenger birds by the evaluation of feathers.

### QUESTIONS????