Wildlife Lead (Pb) Poisoning Working Group

Human health

- No safe level – largest impact on foetus and children
- Lead phased out of most products – e.g. paints & all fuel
- Main remaining sources of lead – **bullets & sinker**

Health of scavenging species

- The more a species is dependent on scavenging (e.g. vultures – obligate scavengers) the higher the lead levels
- Extensive scientific literature on subject – USA, Europe, less from Southern Africa – nothing from Namibia until now
- First evidence came from California with the Condor – 56% of deaths were due to lead poisoning, from ammunition in game
- Lead bullets fragment – into hundreds of pieces – far more than hunters realise

Ministry of Environment, Forestry & Tourism

NAPHA
NAMIBIA PROFESSIONAL HUNTING ASSOCIATION

NCE
Namibian Chamber of Environment

Namibia Nature Foundation
Committed to conservation

UNAM
UNIVERSITY OF NAMIBIA
School of Veterinary Medicine

UNAM
UNIVERSITY OF NAMIBIA
Biological Sciences

Additional Members

(a) Central Veterinary Laboratory, MAWLR
(b) Ministry of Health & Social Services

Register: #07 / #01
Springbok Female 22kg (avg)
150m
Left flank (through)
.243 Win
95gr Berger Classic Hunter
Speed @ crown 3,084 fps
Speed @ impact 2,799 fps
Energy transfer 1,652 ft/lbs

Lead-core Bullet

200x PPTX Zoom
TOTAL
Fragments:
449

How does the lead get into scavengers?

Only from hunting

- Wounded animals that die in the veld
- Eviscerated internal organs dumped in veld
- Area of carcass damaged by bullet cut out and left in veld
- Predators shot & left in veld

Bullet entry and exit holes are places where vultures and other scavengers often start feeding – high lead concentration areas

https://conservationnamibia.com/blog/b2021-unleaded-please.php

ASSESSING LEAD LEVELS AS A POTENTIAL THREAT TO NAMIBIAN VULTURES

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Pb Level Index Group (threshold levels)

Table1. Interpretation of Pb levels in blood, bones and feathers, adapted from Franson and Pain (2011).

Type of tissue	Range	Interpretation
Blood (µg/dL)	<10	Background
	10-20	Mild to moderate subclinical effects
	20-50	Significant subclinical effects
	50-100	Clinical Poisoning
	>100	Severe clinical poisoning
Bone (µg/g)	<10	Background
	10-20	Subclinical to clinical poisoning
	>20	Severe clinical poisoning
Feather (µg/g)	>4	Threshold levels in wild birds

Blood lead levels in LFV and WBV

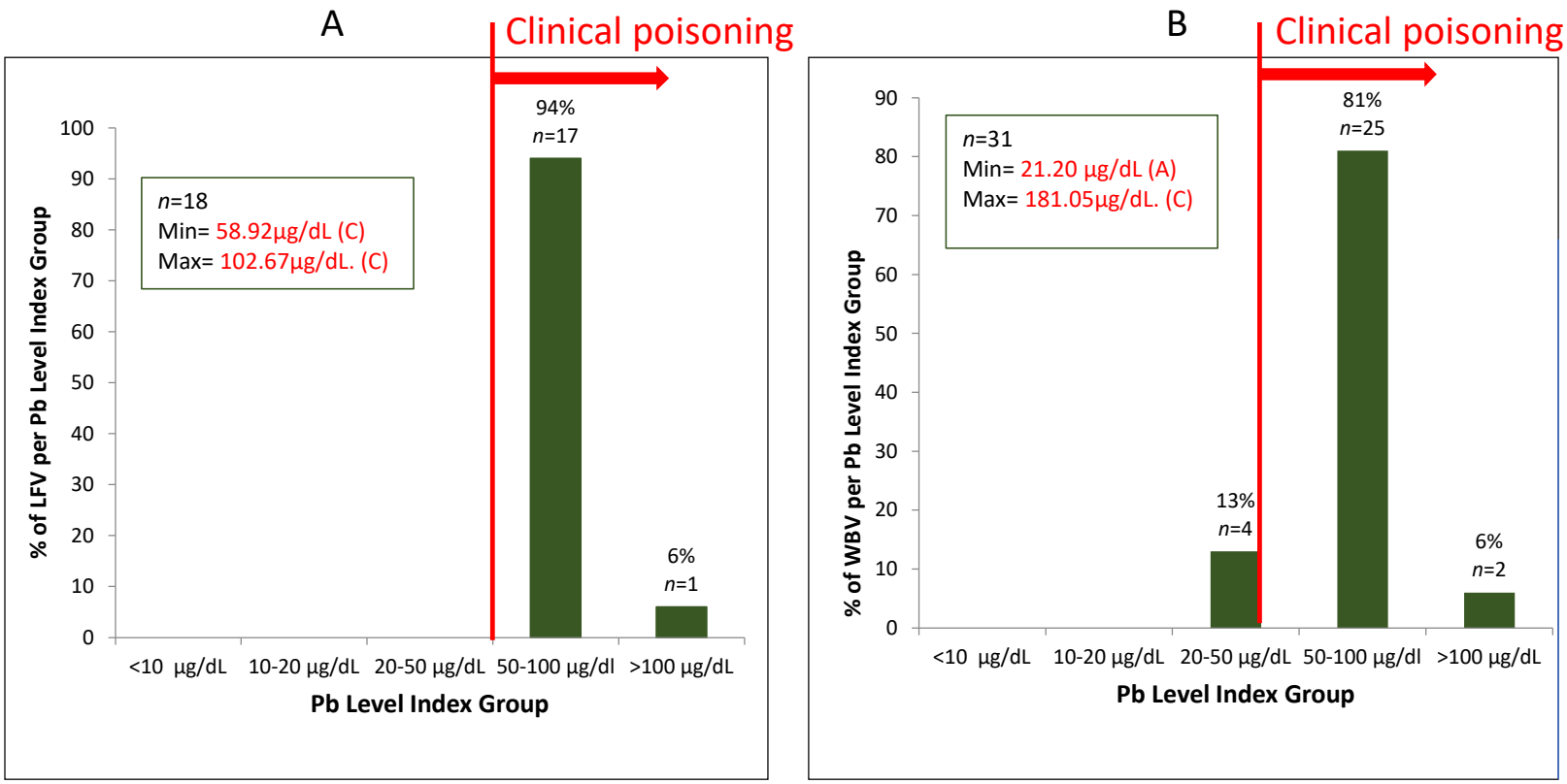

Fig.1. Percentage of LFV (A) and WBV (B) within each blood Pb level index group.

Blood lead levels in different age class and sex categories

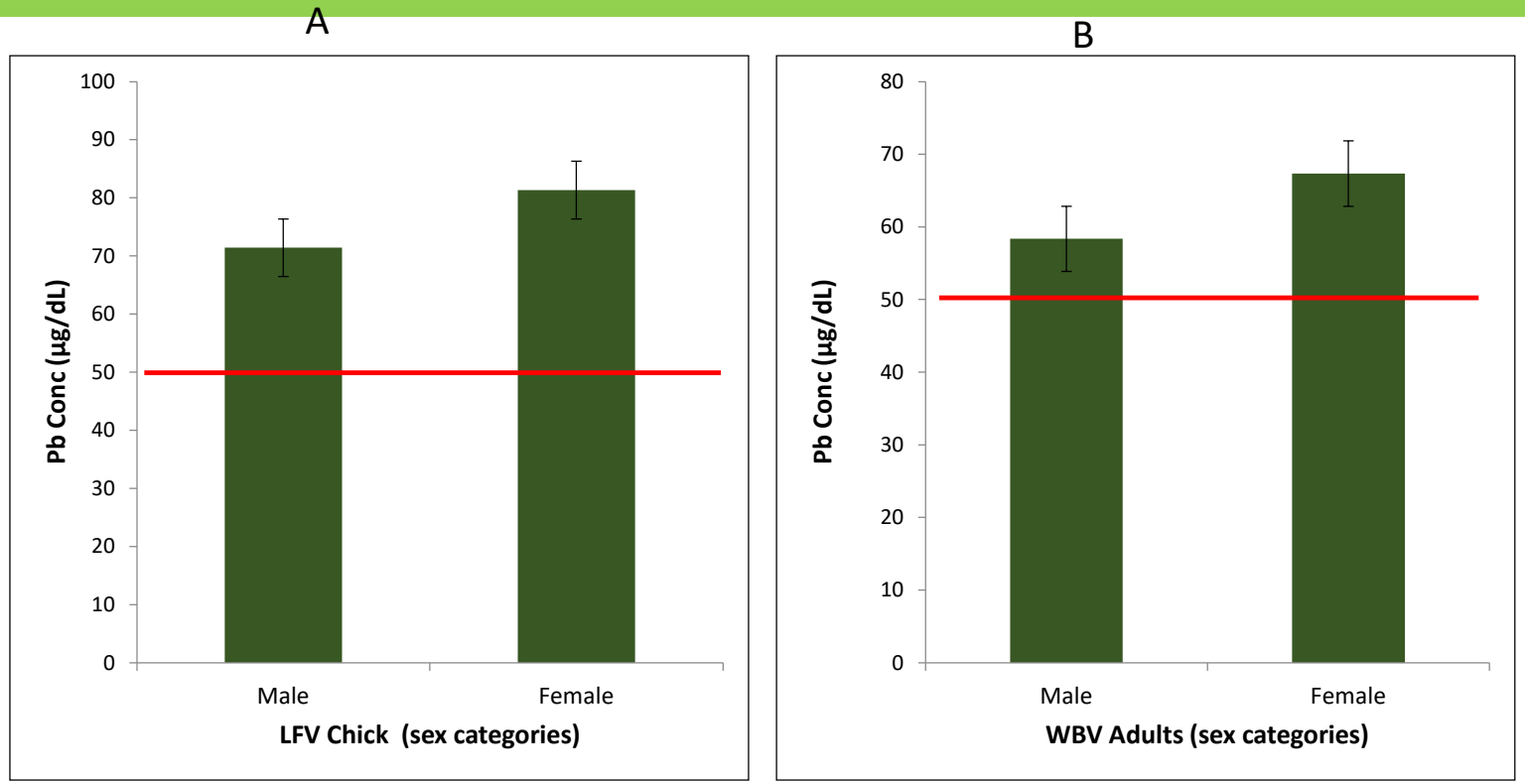

Fig.2. Blood Pb levels in LFV chicks (A) and WBV adults (B), with no significant difference.

LEAD LEVELS IN CARNIVORES IN NAMIBIA

Global status	Common name	Namibian status
Endangered	African Wild Dog	Critically Endangered
Vulnerable	Cheetah	Endangered
Vulnerable	Lion	Vulnerable
Vulnerable	Leopard	Vulnerable
Vulnerable	Black-footed Cat	Vulnerable
Least Concern	Spotted Hyena	Vulnerable
Near Threatened	Brown Hyena	Near Threatened

LIAM REID – Student

DR MARK JAGO & DR JOHN YABE - Supervisors

RESEARCH DESIGN & RESULTS

- Collected carnivore bones – long bones & skulls
- Sample species - jackal, cheetah, hyaena, leopard

- All bone samples tested positive for Pb.
- Maximum [pb] = 14,59 mg/kg (cheetah skull)
- Minimum [pb] = 0,17 mg/kg (hyaena skull)
- Overall average [Pb] = 2,95 mg/kg

Would expect hyaena to have higher Pb than cheetah – cheetah was a captive animal fed shot game meat!

Pb concentration (mg/kg) of long bones of carnivores

	Cheetah	Hyaena	Jackal	Leopard
Min	0,33	3,04	0,42	1,21
Max	2,96	3,04	7,96	3,61
Average	1,42	3,04	2,09	2,42

Pb concentration (mg/kg) of skull bones of carnivores

	Cheetah	Hyaena	Jackal	Leopard
Min	1,59	0,17	0,71	4,92
Max	14,59	1,12	7,96	9,42
Average	4,58	0,65	3,51	7,20

Conclusion

- Alarmingly high levels of Pb in vultures, adults and nestlings
- Fits in with patterns worldwide, including Southern Africa – but worse in Namibia because of our relatively larger wildlife economy
- This is the first study on carnivores – just a starter project, but shows that:

  (i) carnivores have significant lead levels in bones, and

  (ii) research needs to be expanded significantly, to also include blood as well as other carnivore species across the country
- Opportunity for collaboration between the Working Groups

END