

Title:

Health Risks from Lead-Based Ammunition in the Environment - A Consensus Statement of Scientists

Author:

[Bellinger, David C.](#)
[Bradman, Asa](#)
[Burger, Joanna](#)
[Cade, Tom J.](#)
[Cory-Slechta, Deborah A.](#)
[Doak, Daniel](#)
[Finkelstein, Myra](#)
[Flegal, A. Russell](#)
[Fry, Michael](#)
[Green, Rhys E.](#)
[Hu, Howard](#)
[Jacobs, David E.](#)
[Johnson, Christine](#)
[Kelly, Terra](#)
[Kosnett, Michael](#)
[Landrigan, Philip J.](#)
[Lanphear, Bruce](#)
[Mielke, Howard W.](#)
[Newton, Ian](#)
[Pokras, Mark A.](#)
[Poppenga, Robert H.](#)
[Redig, Patrick T.](#)
[Rideout, Bruce A.](#)
[Risebrough, Robert W.](#)
[Scheuhammer, Tony](#)
[Silbergeld, Ellen](#)
[Smith, Donald R.](#)
[Strupp, Barbara](#)
[Thomas, Vernon G.](#)
[Wright, Robert](#)

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Health Risks from Lead-Based Ammunition in the Environment

A Consensus Statement of Scientists

March 22, 2013

We, the undersigned, with scientific expertise in lead and environmental health, endorse the overwhelming scientific evidence on the toxic effects of lead on human and wildlife health. In light of this evidence, we support the reduction and eventual elimination of lead released to the environment through the discharge of lead-based ammunition, in order to protect human and environmental health.

- 1) Lead is one of the most well-studied of all anthropogenic toxins and there is overwhelming scientific evidence that demonstrates:
 - a) Lead is toxic to multiple physiological systems in vertebrate organisms, including the central and peripheral nervous, renal, cardiovascular, reproductive, immune, and hematologic systems. Lead is also potentially carcinogenic; lead is officially recognized as a carcinogen and reproductive toxin in California, and the International Agency for Research on Cancer, the National Toxicology Program, and the US Environmental Protection Agency have identified lead as likely to be carcinogenic to humans.
 - b) There is no level of lead exposure to children known to be without deleterious effects (CDC, 2012). Exposure in childhood to even slightly elevated levels of lead produce lasting neurological deficits in intelligence and behavior.
 - c) Lead is also known to be toxic across different vertebrate organisms, including mammalian and avian species.
- 2) Lead-based ammunition is likely the greatest, largely unregulated source of lead knowingly discharged into the environment in the United States. In contrast, other significant sources of lead in the environment, such as leaded gasoline, lead-based paint, and lead-based solder, are recognized as harmful and have been significantly reduced or eliminated over the past 50 years.
 - a) Lead-based ammunition production is the second largest annual use of lead in the United States, accounting for over 60,000 metric tons consumed in 2012, second only to the consumption of lead in the manufacture of storage batteries (USGS, 2013).
 - b) The release of toxic lead into the environment via the discharge of lead-based ammunition is largely unregulated. Other major categories of lead consumption, such as leaded batteries and sheet lead/lead pipes, are regulated in their environmental discharge/disposal.
- 3) The discharge of lead-based ammunition and accumulation of spent lead-based ammunition in the environment poses significant health risks to humans and wildlife. The best available scientific evidence demonstrates:
 - a) The discharge of lead-based ammunition substantially increases environmental lead levels, especially in areas of concentrated shooting activity (USEPA ISA for Lead draft report, 2012).
 - b) The discharge of lead-based ammunition is known to pose risks of elevated lead exposure to gun users (NRC, 2012).
 - c) Lead-based bullets used to shoot wildlife can fragment into hundreds of small pieces, with a large proportion being sufficiently small to be easily ingested by scavenging animals or incorporated into processed meat for human consumption (Pauli and Burkirk, 2007; Hunt *et al.*, 2009; Knott *et al.*, 2010).

- d) Lead-based ammunition is a significant source of lead exposure in humans that ingest wild game (Hanning *et al.*, 2003; Levesque *et al.*, 2003; Johansen *et al.*, 2006; Tsuji *et al.*, 2008), and hunters consuming meat shot with lead-based ammunition have been shown to have lead pellets/fragments in their gastrointestinal tract (Carey, 1977; Reddy, 1985).
- e) Lead poisoning from ingestion of spent lead-based ammunition fragments poses a serious and significant threat to California wildlife.
 - i. Spent lead-based ammunition is the principal source of lead exposure to the endangered California condor, and lead poisoning in condors is preventing their successful recovery in the wild (Church *et al.*, 2006; Woods *et al.*, 2007; Green *et al.*, 2008; Parish *et al.*, 2009; Rideout *et al.*, 2012; Finkelstein *et al.*, 2012).
 - ii. Many other wild scavenging species, such as golden eagles, bald eagles, ravens, turkey vultures, and pumas are known to be exposed to and affected by lead (Wayland and Bollinger, 1999; Clark and Scheuhammer, 2003; Fisher *et al.*, 2006; Craighead and Bedrosian, 2008; Stauber *et al.*, 2010; Kelly and Johnson, 2011; Burco *et al.*, 2012).

Based on overwhelming evidence for the toxic effects of lead in humans and wildlife, even at very low exposure levels, convincing data that the discharge of lead-based ammunition into the environment poses significant risks of lead exposure to humans and wildlife, and the availability of non-lead alternative products for hunting (Thomas, 2013), we support reducing and eventually eliminating the introduction of lead into the environment from lead-based ammunition.

Signed,

David C. Bellinger, PhD, MSc
Professor
Neurology and Environmental Health
Harvard Medical School
Harvard School of Public Health
Boston, MA 02115

Deborah A. Cory-Slechta, PhD
Professor of Environmental Medicine and of
Pediatrics
University of Rochester School of Medicine
Box EHSC
Rochester, NY 14642

Asa Bradman, PhD, MS
Center for Environmental Research and
Children's Health (CERCH)
School of Public Health
University of California, Berkeley
Berkeley, CA 94720

Daniel Doak, PhD
Professor and Colorado Chair in
Environmental Studies
Environmental Studies Program
University of Colorado Boulder
Boulder, CO 80309

Joanna Burger, PhD
Distinguished Professor of Biology
604 Allison Road
Rutgers University
Piscataway, NJ 08854

Myra Finkelstein, PhD
Adjunct Assistant Professor
Microbiology and Environmental Toxicology
University of California
Santa Cruz, CA 95064

Tom J. Cade, PhD
Professor Emeritus of Zoology
Department of Ecology and Evolutionary
Biology, Cornell University, Ithaca, NY
6484 Hollilynn Dr.
Boise, ID 83709

A. Russell Flegal, PhD
Professor
Department of Earth & Planetary Sciences
University of California, Santa Cruz
Santa Cruz, CA 95064

Michael Fry, PhD

Research Physiologist (retired)
Department of Avian Sciences
University of California, Davis
Davis, CA 95616

Rhys E. Green, PhD

Professor of Conservation Science
University of Cambridge
Department of Zoology
Downing Street
Cambridge CB2 3EJ
United Kingdom

Howard Hu, MD, MPH, ScD

Director & Professor
Dalla Lana School of Public Health
University of Toronto
Toronto, ON M5T 3M7
Canada

David E. Jacobs, PhD, CIH

Research Director, National Center for
Healthy Housing
Adjunct Associate Professor, University of
Illinois at Chicago School of Public Health
Washington DC 20016

Christine Johnson, DVM, PhD

Associate Professor of Ecosystem Health
and Epidemiology
School of Veterinary Medicine, Wildlife
Health Center
University of California, Davis
Davis, CA 95616

Terra Kelly, DVM, PhD, Dipl. ACZM

Wildlife Veterinarian and Epidemiologist
School of Veterinary Medicine, Wildlife
Health Center
University of California, Davis
Davis, CA 95616

Michael Kosnett, MD, MPH

Associate Clinical Professor
Division of Clinical Pharmacology &
Toxicology
Department of Medicine, University of
Colorado School of Medicine
Department of Environmental and
Occupational Health,
Colorado School of Public Health
Aurora, CO 80045

Philip J. Landrigan, MD, MSc

Dean for Global Health
Ethel H. Wise Professor and Chairman
Department of Preventive Medicine
Professor of Pediatrics
Director, Children's Environmental
Health Center
Mount Sinai School of Medicine
New York, NY 10029

Bruce Lanphear, MD, MPH

Clinician Scientist, Child & Family Research
Institute
BC Children's Hospital Professor
Simon Fraser University
Vancouver, BC V6H 3N1
Canada

Howard W. Mielke, PhD

Professor
Department of Pharmacology
Tulane University School of Medicine
New Orleans, LA 70112

Ian Newton, D.Sc, OBE, FRS, FRSE

Emeritus Fellow,
Centre for Ecology & Hydrology
Benson Lane, Crowmarsh Gifford
Wallingford, Oxon OX10 8BB
United Kingdom

Mark A. Pokras, DVM

Associate Professor
Wildlife Clinic & Center for Conservation
Medicine Tufts University
Cummings School of Veterinary Medicine
N. Grafton, MA 01536

Robert H. Poppenga, DVM, PhD, DABVT
CAHFS Toxicology Laboratory
School of Veterinary Medicine
University of California
West Health Sciences Drive
Davis, CA 95616

Patrick T. Redig, DVM, PhD
Professor of Avian Medicine & Surgery
Founder & Director Emeritus of The Raptor
Center
University of Minnesota
St. Paul, MN 55108

Bruce A. Rideout, DVM, PhD
Wildlife Disease Laboratories
Institute for Conservation Research
San Diego Zoo Global
PO Box 120551
San Diego, CA 92112

Robert W. Risebrough, PhD
Research Ecologist (retired)
University of California, Berkeley and Santa
Cruz
Executive Director, Bodega Bay Institute
2711 Piedmont Avenue
Berkeley, CA 94705

Tony Scheuhammer, PhD
Emeritus Scientist
National Wildlife Research Centre
Carleton University
Ottawa, ON K1A 0H3
Canada

Ellen Silbergeld, PhD
Professor
Department of Environmental Health
Sciences
Department of Epidemiology
Department of Health Policy and
Management
Johns Hopkins University
Baltimore, MD 21205

Donald R. Smith, PhD
Professor
Microbiology and Environmental Toxicology
University of California
Santa Cruz, CA 95064

Barbara Strupp, PhD
Professor
Division of Nutritional Sciences
Cornell University
Ithaca, NY 14853

**Vernon G. Thomas, BA, MA (Oxon), MSc,
PhD**
Professor Emeritus
Department of Integrative Biology
College of Biological Science
University of Guelph,
Guelph, ON N1G 2W1
Canada

Robert Wright, MD, MPH
Professor of Pediatrics
Department of Preventive Medicine
Mount Sinai School of Medicine
New York, NY 10029

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