

Are We Scaring Ourselves To Death?

by

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Drinking Water

- Can I Drink It?



Water well at mountain cabin

- Minimum detectable level for lead
 - ppm (0.0000001) 1950's
 - ppb (0.0000000001) 1965
 - ppt (0.000000000000001) 1975
 - ppq (0.0000000000000000001) today

The case of the vanishing zero

0 0 0 0 0 .



One ppq

- One part in 10^{15}
- One drop in

13,000,000,000 gallons

45,000 rail cars

Toxicologists

- Small amounts are not a problem
- Body is made to ward off environmental pollutants
 - Intestinal lining
 - Covering of eye
 - Skin
 - Liver

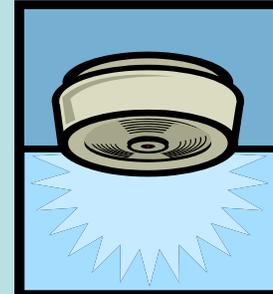


Toxicologists

- Everything is harmful in the right amount
- Most things are not harmful in small amounts
- How much and how often
- Constant warnings make us numb to real dangers

Focus on real hazards

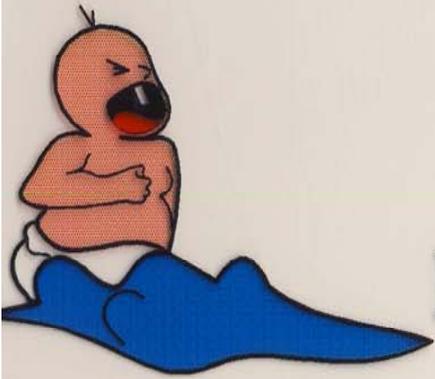
Cigarette smoking
Seat belt usage
Smoke detector use
Diet
Drug/alcohol abuse
Unsafe sexual behavior



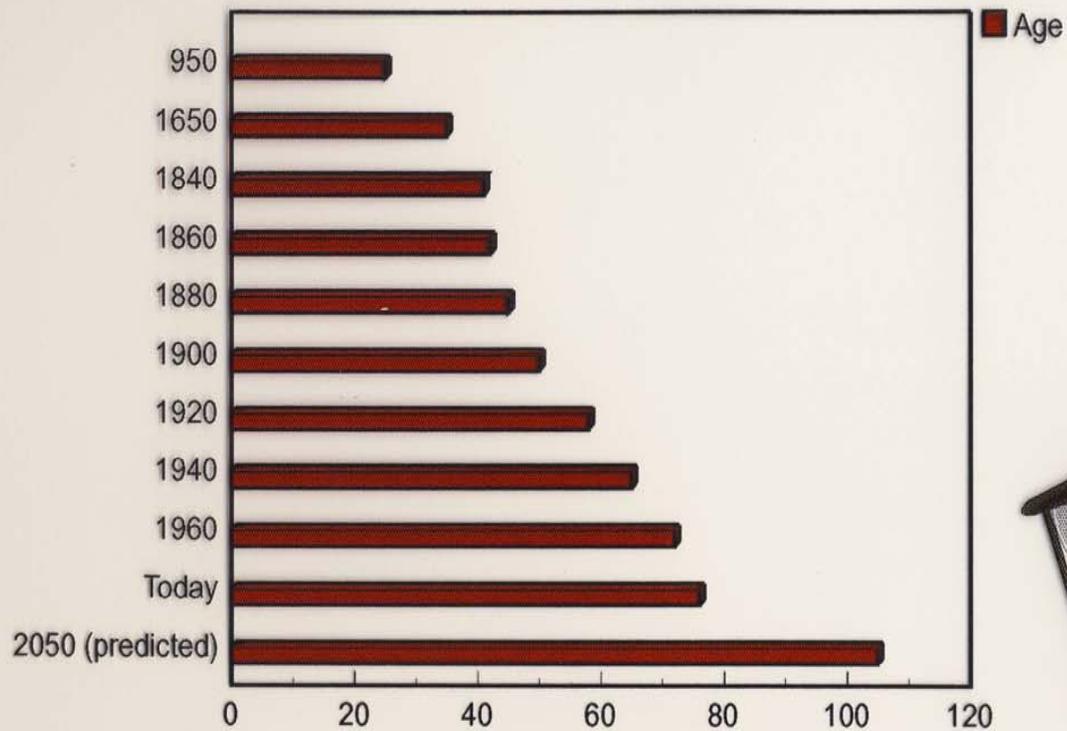
We are the healthiest we have ever been –
increasing life expectancy

Tanning Booths

- Teenagers call them “Fake and Bake”
- Increase melanoma incidences in women aged 20-40 by two (based on one visit per month)
- See dermatologist regularly if used

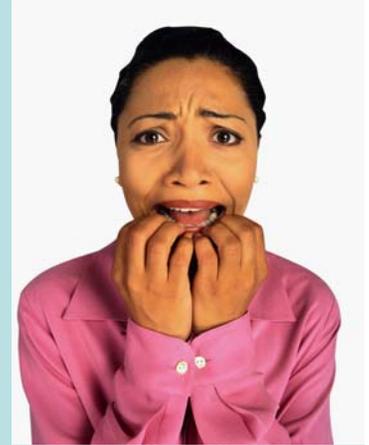


Life Expectancy in Years



Big Fear – Little Risk

- Carcinogens and mutagens are everywhere
- Plants make them to ward off insects
- High dose – problems
Low dose – no known problem
- Irradiation of food/canning of food



Cleanup at Landfill

- HF spill
- Cleanup of contaminated soil
- To what level do you clean?



Cleanup of Uranium Mill Tailings

- Radioactivity
- Grand Junction, Colorado
- Moab, Utah to begin



Cleanup of Nuclear Facilities

- How clean is clean?
- No detectable activity
- Half life of contaminant
- Leave in place
- Remove to another site
- Public relations



Perception

- Some hazards are perceptions by people
- Which is the most hazardous
 - Airline travel
 - Automobile travel
 - Train travel

Fatalities for 2005

- 22 - Commercial aircraft
- 887 – Trains (includes crossings)
- 43,443 - Automobiles

Fatalities per 100M miles

Type	fatalities	injuries	m/miles
Planes	2.7	1.6	8,166
Trains	18	993	90
Autos	14.7	941	2,989,807

Source: DOT Transportation Statistics

Perspective

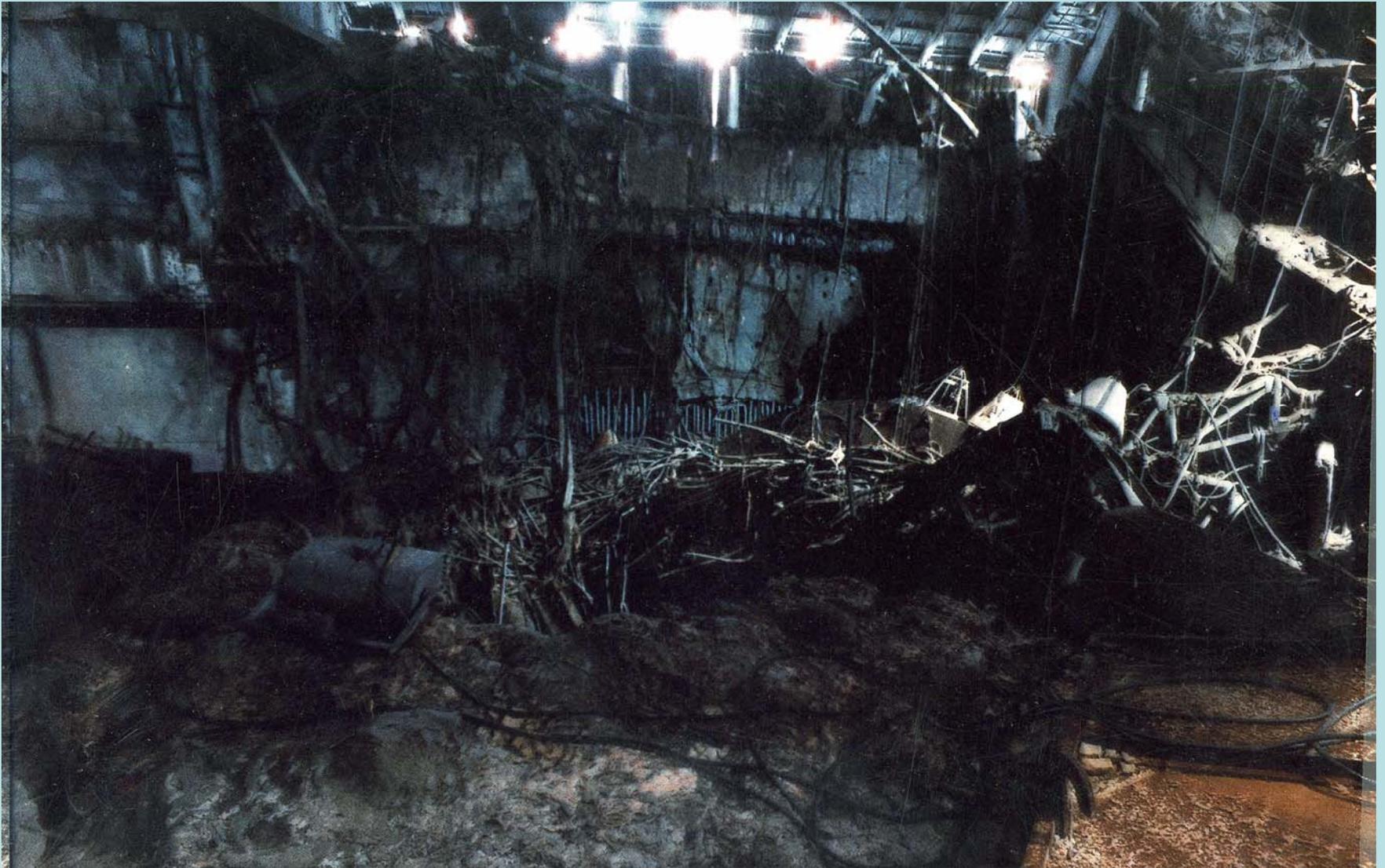
- Cars have 6.2 million accidents/year
- 2.7 million injured/year
- 4.3 million crashes with other cars/year



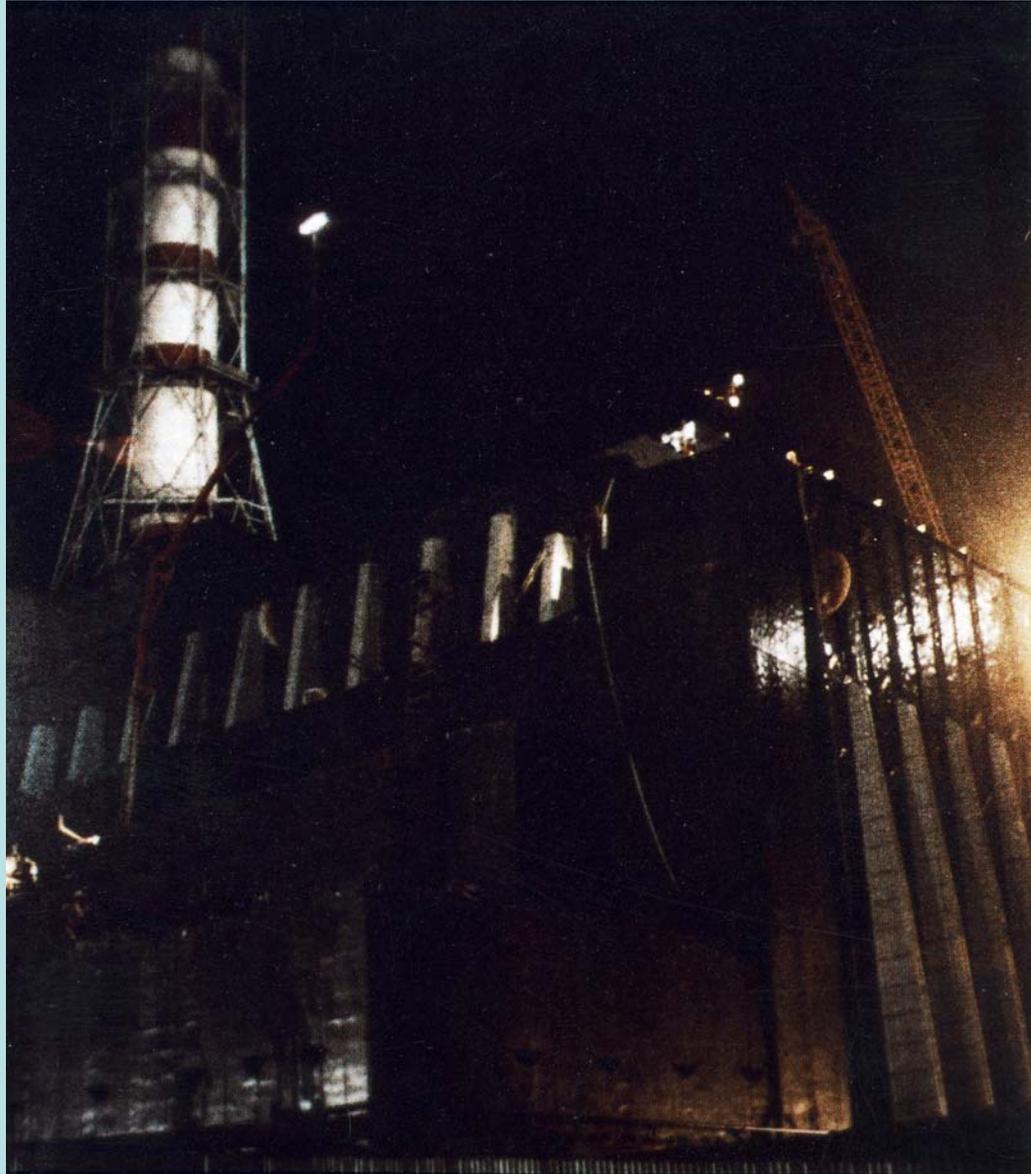
Hazardous Activities/Technology

- Pick the top five – in order
 - Surgery
 - Motorcycles
 - Nuclear power
 - Mountain climbing
 - Alcoholic beverages
 - Police work
 - Large construction
 - Handguns
 - Food preservatives
 - Fire fighting
 - Swimming
 - Motor vehicles
 - Smoking
 - Railroads
 - School football
 - Pesticides
 - Hunting
 - Contraceptive use

Chernobyl Reactor Accident



Chernobyl Sarcophagus



Chernobyl

- Worst reactor accident in history
- Radioactive material dispersed throughout the entire world
- 33 people died
- Many cases of thyroid cancer
 - Primarily children
 - Could have been prevented
 - Thyroid cancer is operable

Child Safety Seats

- Millions \$ spent on compliance
- Police setup checks on installation
- Major news media coverage
- Many emails
- Warning labels

Child Seat Fatalities

- Less than 10 nationwide

Other Concerns

- E-coli
- Salmonella
- Lead paint
- Bird flu
- Taxes
- Guns in classrooms
- Transportation of hazardous materials
- Others