



Satellite Events, 31st August,

Environmental preparedness and response to environmental disasters



Let's start by.....

- **Introduction:** Environmental-Health disaster definitions and impacts
- **Objectives** of the meeting



DEFINITIONS OF DISASTER

“A disaster can be defined as any occurrence that cause damage, ecological disruption, loss of human life, deterioration of health and health services on a scale, sufficient to warrant an extraordinary response from outside the affected community or area”.

(W.H.O.)

“A disaster can be defined as an occurrence either nature or manmade that causes human suffering and creates human needs that victims cannot alleviate without assistance”.

American Red Cross (ARC)

'disaster' means any situation which has or may have a severe impact on people, the environment, or property, including cultural heritage;

(European Parliament)

TYPES OF DISASTER

Natural Disasters

Meteorological

Topographical

Environmental

Man-made Disasters

Technological

Industrial accidents

Security related





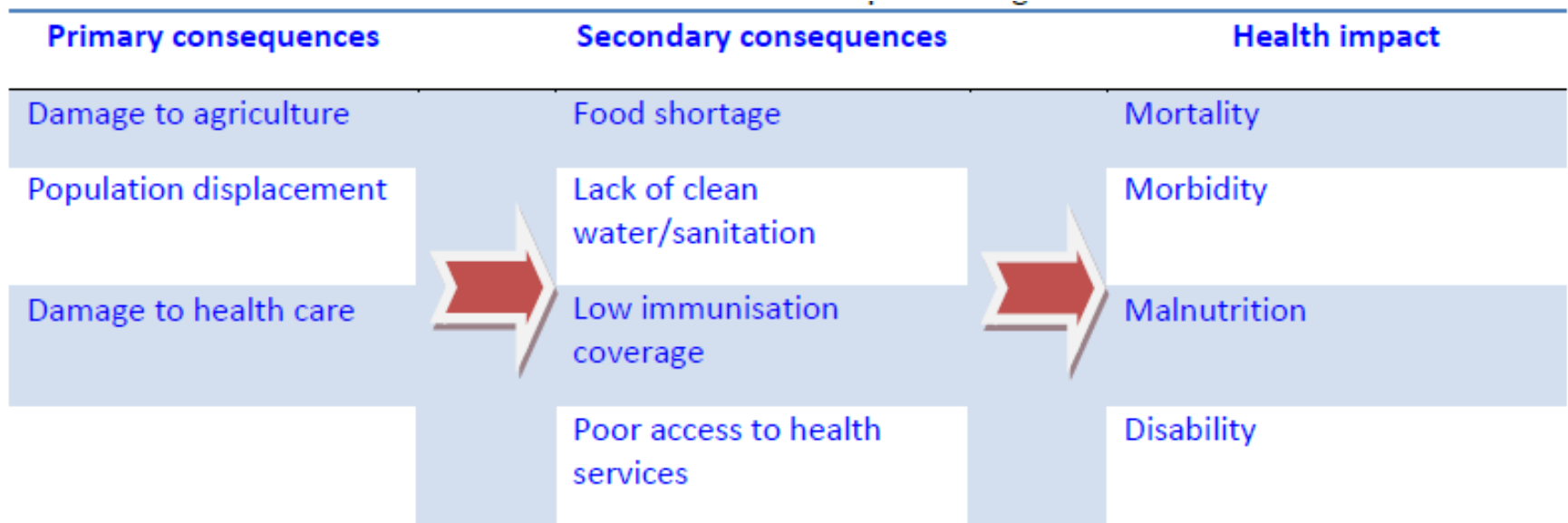
Table 1. Examples of different types of disasters

Natural Disasters	Technological/Human-induced Disasters	Complex Emergencies
<ul style="list-style-type: none">• Earthquakes• Extreme Heat• Floods• Drought• Tropical cyclones• Landslides• Tomadoes• Tsunamis• Volcanoes• Wildfires• Winter Weather• Infectious disease outbreaks	<ul style="list-style-type: none">• Radiation emergencies from nuclear blasts, nuclear reactor accidents, or accidental spills of radioactive material• Accidental release of hazardous chemicals• Bioterrorism• Oil spills• Bombing or destroying a nuclear reactor	<ul style="list-style-type: none">• War• Conflict

Table 2. Direct and indirect health effects of natural disasters

Type of Disaster	Direct Health Effects	Indirect Health Effects
Hurricane/cyclone	<ul style="list-style-type: none"> • Drowning • Injuries from flying debris (e.g., head and chest trauma) • Injuries from submerged debris or structures (e.g., puncture wounds) 	<ul style="list-style-type: none"> • Worsening of chronic disease • Carbon monoxide poisoning • Waterborne disease • Vector-borne disease • Disease outbreak • Mental health concerns
Tornado	<ul style="list-style-type: none"> • Injuries from flying debris or structural collapse 	<ul style="list-style-type: none"> • Worsening of chronic disease • Carbon monoxide poisoning • Waterborne disease • Vector-borne disease • Disease outbreak • Mental health concerns
Flood	<ul style="list-style-type: none"> • Drowning • Injuries from submerged debris or structures 	<ul style="list-style-type: none"> • Worsening of chronic disease • Carbon monoxide poisoning • Waterborne disease • Vector-borne disease • Disease outbreak • Mental health concerns
Earthquake	<ul style="list-style-type: none"> • Injuries from rock slides or collapsed buildings • Drowning from ensuing tsunami 	<ul style="list-style-type: none"> • Worsening of chronic disease • Carbon monoxide poisoning • Waterborne disease • Vector-borne disease • Disease outbreak • Mental health concerns
Volcanic eruption	<ul style="list-style-type: none"> • Suffocation by ash or toxic gases • Injuries, including burn injuries, from mud or lava flows • Drowning from ensuing tsunami 	<ul style="list-style-type: none"> • Worsening of chronic disease • Carbon monoxide poisoning • Waterborne disease • Vector-borne disease • Disease outbreak • Mental health concerns

Health effects of complex emergencies



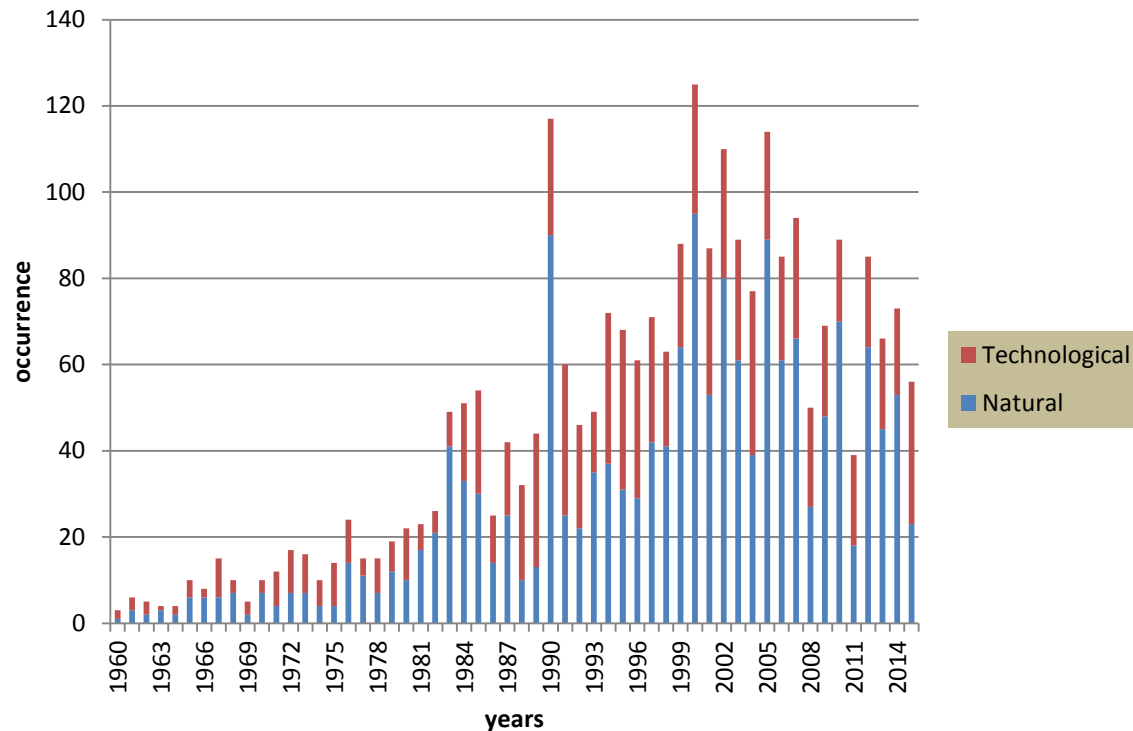
(Source AVOID 2011)

The impact of disasters, 1

Distribution of Extreme Natural Events by year and type in Europe (1960-2015)

Europe (54 countries)

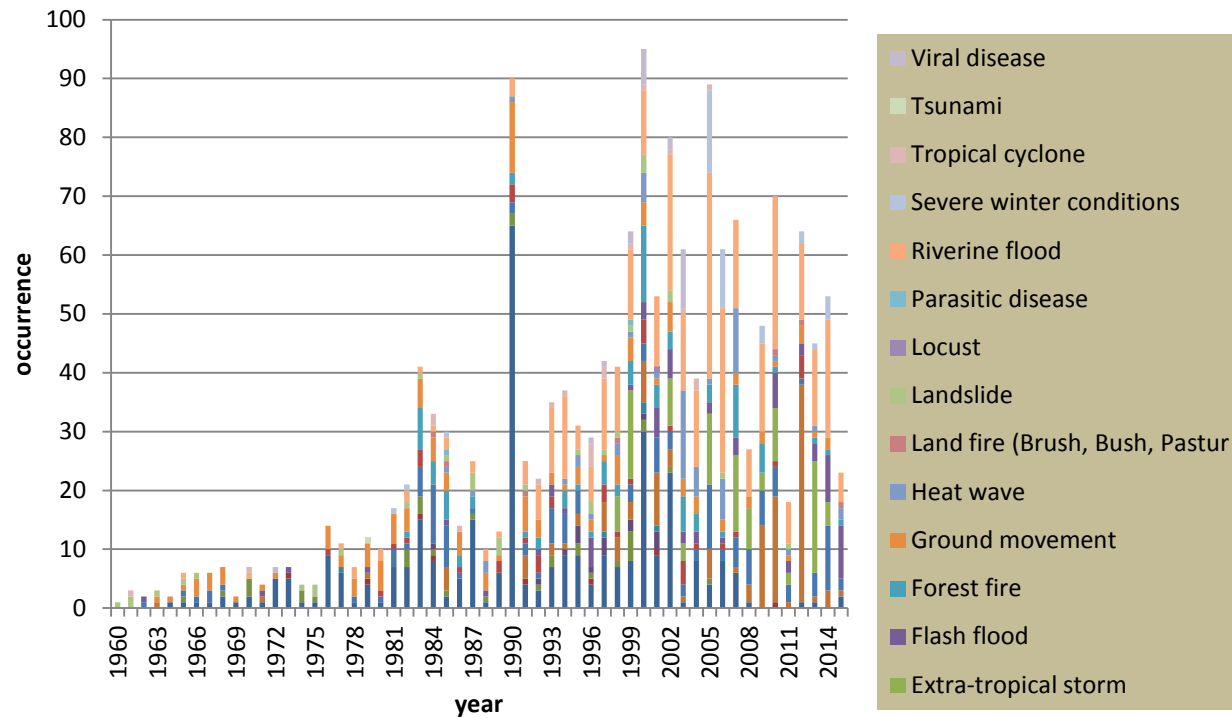
- 2,593 n. disasters
 - 1,637 natural
 - 957 technological
- 230,555 fatalities
- 163,487 injured
- > 44 mill. affected



The impact of disasters, 2

Distribution of Extreme Natural Events by year and type in Europe (1960-2015)

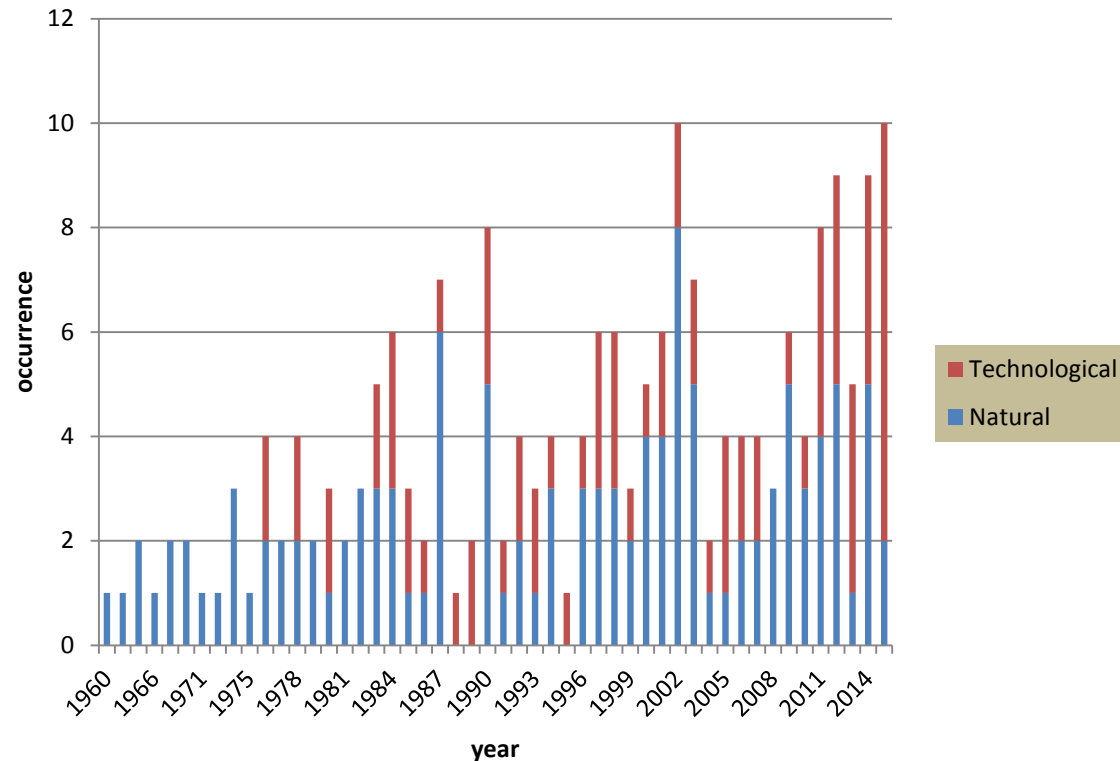
- 196,779 fatalities
- > 40 mill. affected



The impact of disasters, 3

Distribution of Disasters by year and type in Italy (1960-2015)

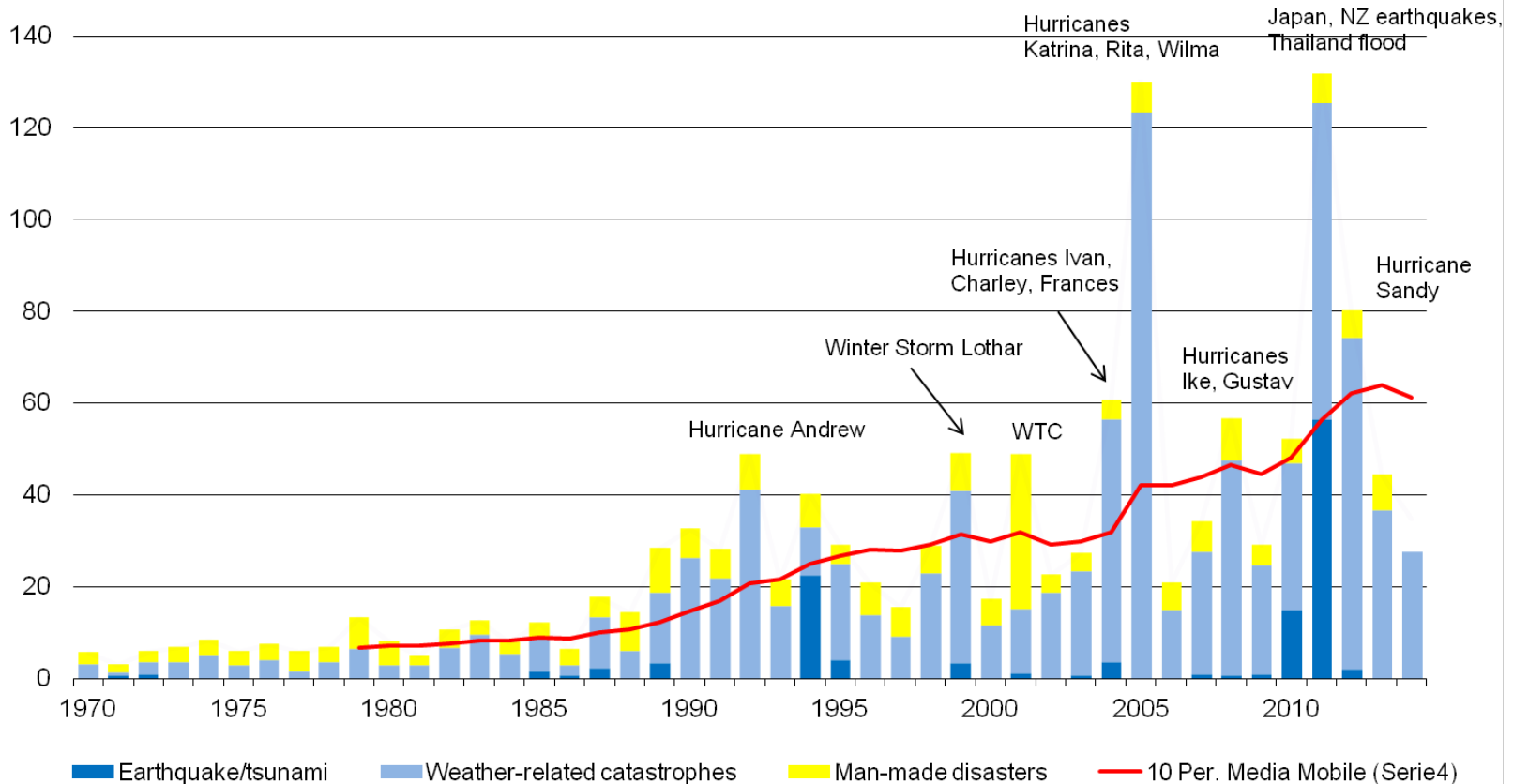
- 198 disasters
 - 121 natural
 - 77 technological
- 32,646 fatalities
- 3,838,703 affected



The impact of disasters, 4

Economic and insured losses

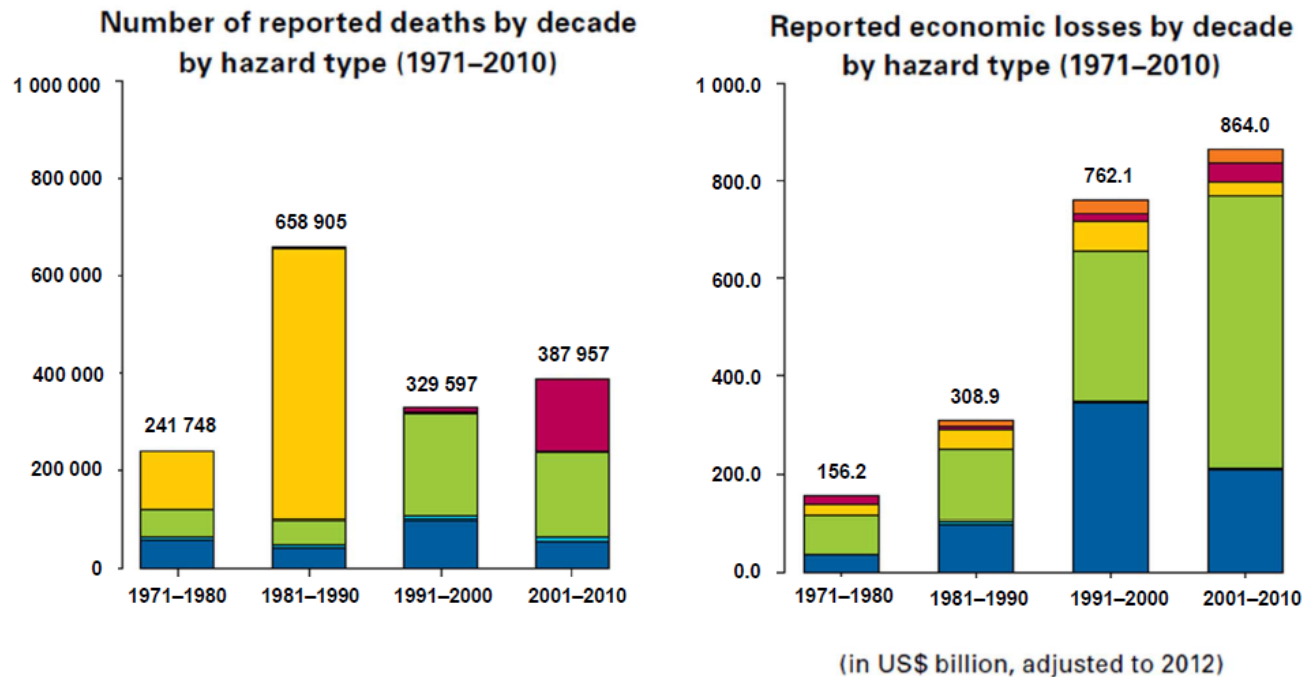
in USD bn,
at 2014 prices



Source: Swiss Re

The impact of disasters, 5

Deaths and economic losses by hydrometeorological hazards



■ Floods ■ Mass movement wet ■ Storms ■ Droughts ■ Extreme temperature ■ Wildfires

Increasing disaster risk

- ✓ Increasing population density
- ✓ Increased settlement in high-risks areas
- ✓ Increased technological hazards and dependency
- ✓ Increased terrorism: biological, chemical, nuclear?
- ✓ Aging population in industrialized countries
- ✓ Emerging infectious diseases (Zika)
- ✓ International travel (global village)

- Increasing Global Travel
 - Rapid access to large populations
 - Poor global security & awareness
- ... create the potential for simultaneous creation of large numbers of casualties





As a result....

As a result, epidemiological approaches and methods are becoming more and more important to assess:

- **Before the event:**

- the policy context, in terms of national approaches to civil protection, environmental responses, and public health tools available
- the geographic and social distribution of the hazard, exposure to it, and vulnerability to it in its physical and human dimensions
- the distribution of available interventions



As a result....(cont'd)

- **During the event:**
 - Specific health needs including physical health, mental health and social care and support the civil protection agencies responses
- **After the event:**
 - evaluation of effectiveness of security and public health interventions
 - definition and quantification of health impacts including physical and mental health
 - identification post-event rehabilitation needs and subsequent evaluation



Aim of the meeting

- Several countries have developed epidemiology tools for capturing population impacts. The experiences have been varied but there is a global demand for effective tools to address this challenge
- To share epidemiological tools and experiences on response to environmental disasters



Objectives of the meeting

To provide:

- An overview of environmental epidemiological response activities following selected disasters in the United States and Europe
- An understanding of capacity building resources provided by US-CDC (e.g. CASPER Toolkit, A primer for understanding the principles and practices of disaster surveillance in the United States and Disaster epidemiology and training modules for Field Epidemiology Training Program [FETP] fellows)



Objectives of the meeting (cont'd)

- Case study of flooding in UK. Awareness of practical aspects of population identification methods to provide health professionals with a tool for a rapid cohort recruitment
- Case study of an industrial disaster in Italy, the Seveso accident, which caused environmental contamination by 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) and prompted epidemiological investigations to monitor possible short- and long term effects in the exposed population
- Case study of earthquake in Italy. Lessons learnt to enhance resilience of local communities.
- Health surveillance after natural disasters. Lessons learnt from Italian earthquakes

Thank you!

**Have a nice
“event”**