



SUSY SAFE  
Surveillance System on Suffocation Injuries Due to Foreign Bodies in European Children  
Funded by the European Commission, DG SANCO, Consumer Affairs Directorate



**“Foreign Body injuries in children: Italian and Chinese experience”**

**Webinar**

*In the frame of the Memorandum of Understanding between the National Institute of Health of the Italian Republic and the Health Human Resources Development Center, National Health Commission of the People's Republic of China for International Cooperation, on health professional development.*

# The Susy Safe Registry

Short presentation, epidemiology, data analysis and results

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# Epidemiological background

- Choking due to foreign bodies (FB) is a **leading cause of death in children aged 0-3** and it is common also in older ages, up to 14 years.
- The estimated number of incidents per year in children aged 0-14 is in EU of about **50.000, 10% of which are fatal**
- About **10.000 accidents involve inorganic objects**, in general industrial products, mostly plastic and metal parts, coins, and toys.
- Out of the estimated **2.000 incidents per year involving toys**, the fatalities are 20.



## Inhaled Foreign Bodies in Children: A Global Perspective on Their Epidemiological, Clinical, and Preventive Aspects

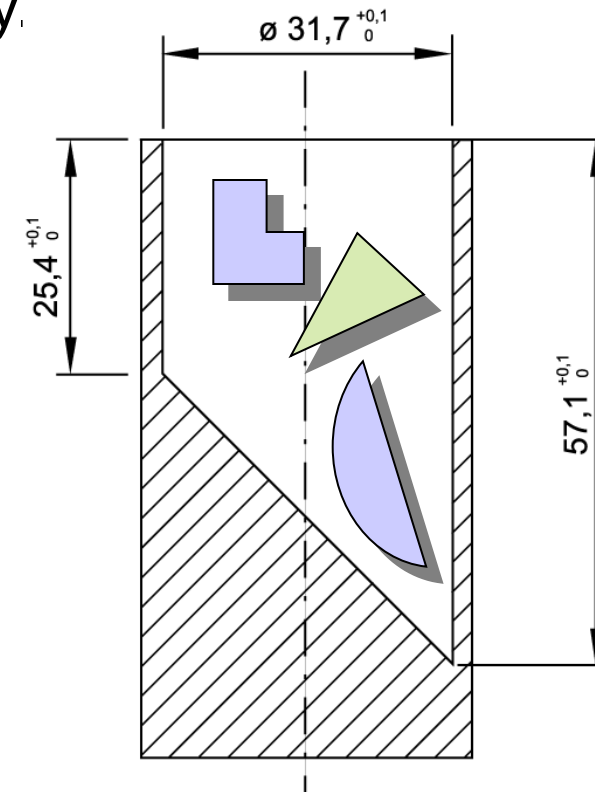
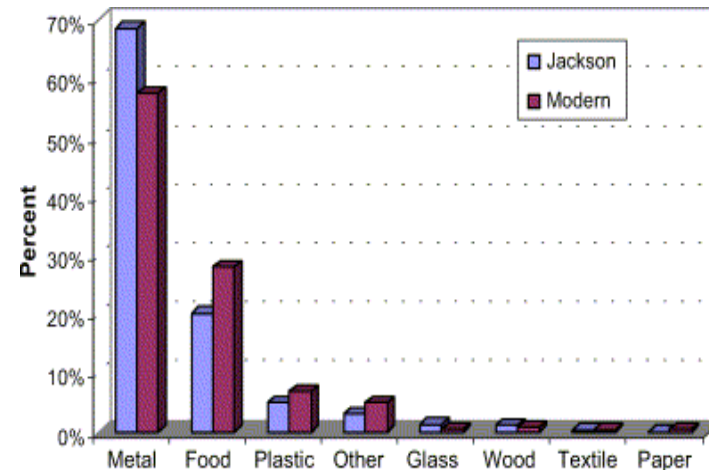
Francesca Foltran, MD, PhD,<sup>1</sup> Simonetta Ballali, BS,<sup>1</sup> Hugo Rodriguez, MD,<sup>2</sup>  
Arjan B. (Sebastian) van As, MD, PhD,<sup>3</sup> Desiderio Passali, MD,<sup>4</sup> Achal Gulati, MD,<sup>5</sup>  
and Dario Gregori, MA, PhD<sup>1\*</sup>

	Number of Articles	Cases	Total Number (N)	Pooled-Proportion	CI-lb	CI-ub
<b>Nuts</b>	96	6504	18536	0.395	0.340	0.450
<b>Seeds</b>	64	3678	14227	0.256	0.210	0.301
...						
<b>Candy</b>	6	59	2713	0.021	0.007	0.036
<b>Apples</b>	12	88	3920	0.020	0.013	0.027
<b>Hotdog</b>	6	72	2710	0.019	-0.001	0.039
<b>Organic Overall</b>	<b>172</b>	<b>19113</b>	<b>29881</b>	<b>0.558</b>	<b>0.549</b>	<b>0.567</b>



# Statistics / history

- Many attempts have been performed, to understand the relationship between shape and size of the object, obstruction location and injury severity.
- Chevalier Jackson (endoscopist) and colleagues removed 3200 objects between 1920 and 1932 (JC collection)
- Based on the JC collection, the **small part cylinder** was developed in the 1970s (by CPSC = Consumer Product Safety Comm., BPS = Bureau of Product Safety)





Contents lists available at [SciVerse ScienceDirect](https://www.sciencedirect.com)

## International Journal of Pediatric Otorhinolaryngology

journal homepage: [www.elsevier.com/locate/ijporl](http://www.elsevier.com/locate/ijporl)



Editorial

### Foreign bodies injuries: A strong unique pathway linking ORL and public health



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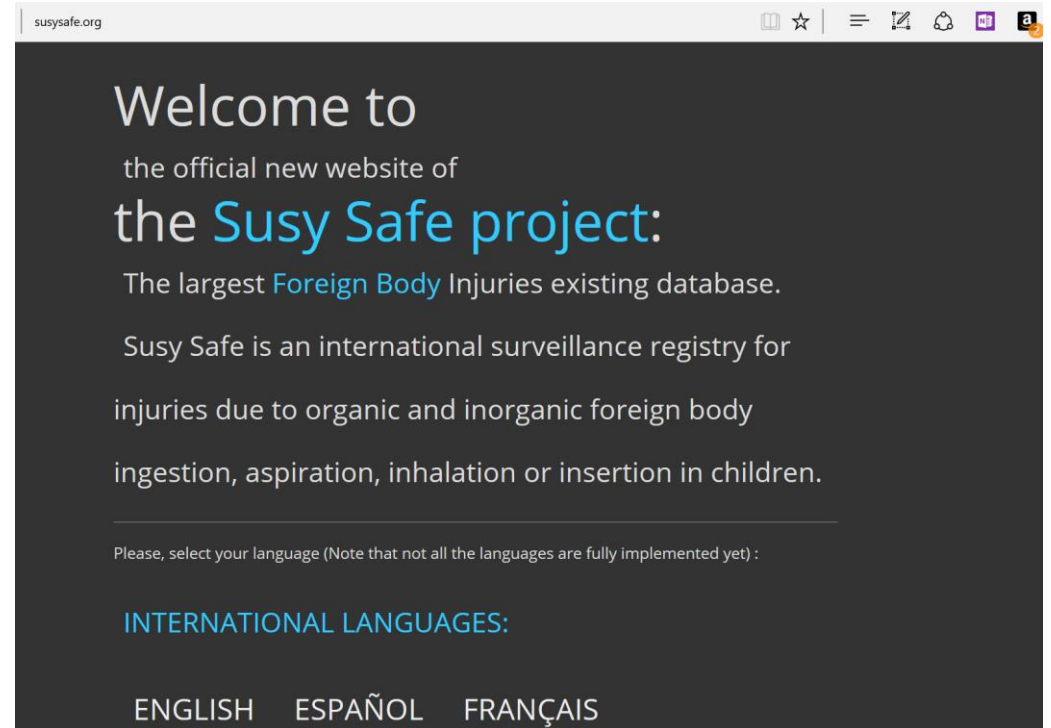
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# SusySafe project

- Aim of the project is to **establish a data collection for injuries due to foreign bodies**, gathering data on choking, in order to:
  - provide a **risk-analysis profile for products** causing the injury **in terms of its characteristics** with the aim at:
    - creating a **surveillance systems** for suffocation injuries caused to young consumers by inappropriate product design or packaging;

# www.susysafe.org



susysafe.org

Welcome to  
the official new website of  
the **Susy Safe project**:  
The largest **Foreign Body** Injuries existing database.  
Susy Safe is an international surveillance registry for  
injuries due to organic and inorganic foreign body  
ingestion, aspiration, inhalation or insertion in children.

Please, select your language (Note that not all the languages are fully implemented yet) :

**INTERNATIONAL LANGUAGES:**

ENGLISH   ESPAÑOL   FRANÇAIS



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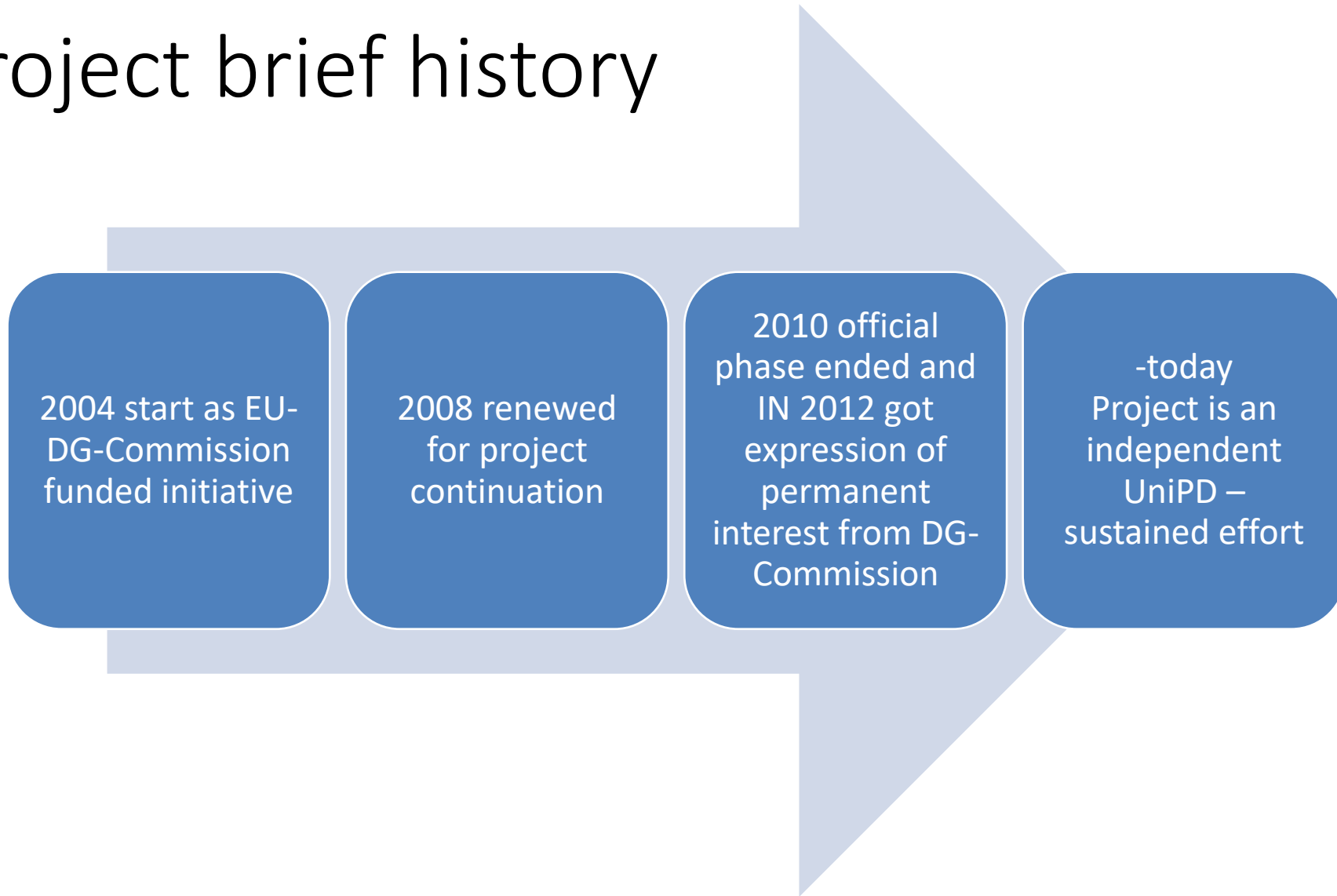
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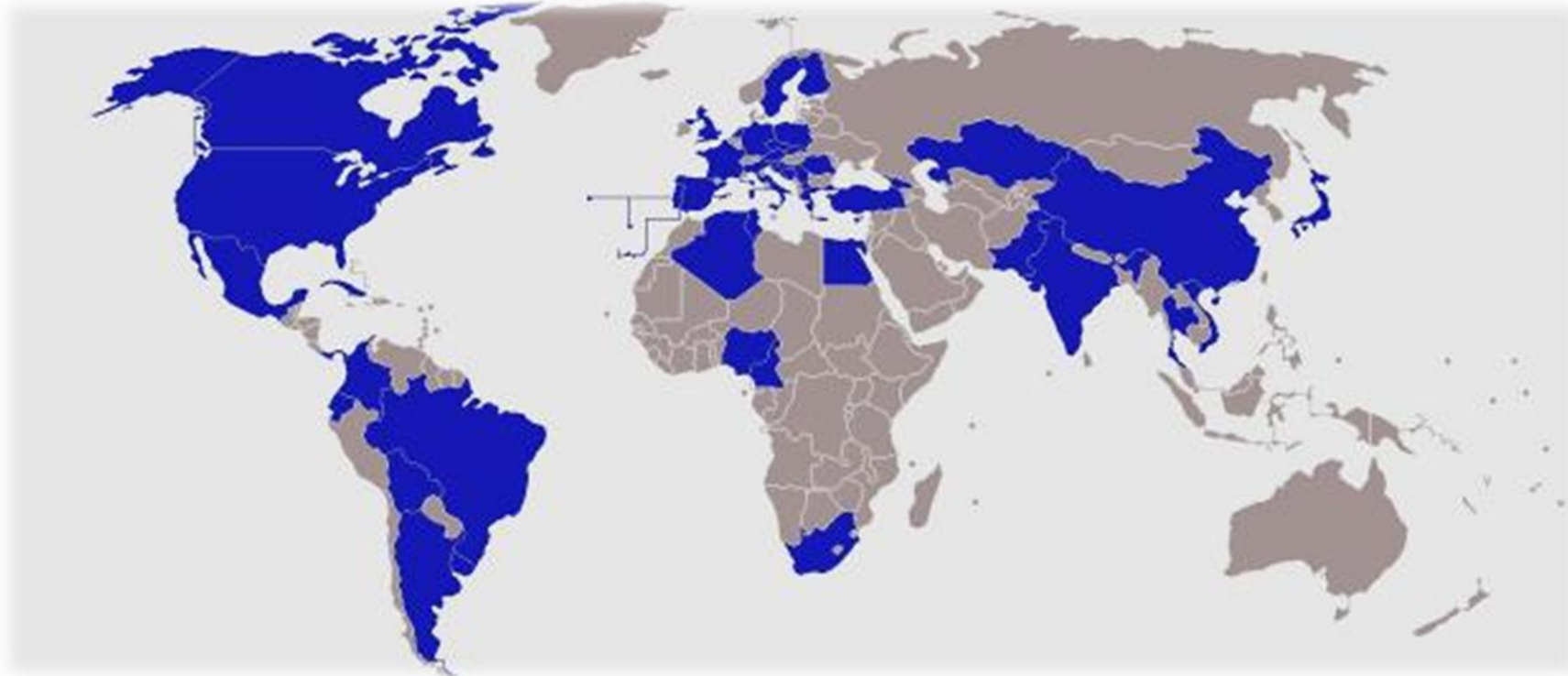
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# SS project brief history





# The Susy Safe DataBase



**At 2021 35065 injuries**

+ about 13000 from the Italian Ministry of Health  
+ 366 MagDb data



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# SS Basic Data Model Structure (SS-BDMS)

The screenshot shows a software window titled "Susysafe Case Report" with a menu bar containing "File", "Backup", and "Help". The main area is titled "Patient details" and contains the following fields:

- Date of Birth:** Three dropdown menus for day (1), month (1), and year (1996), followed by the text "(dd mm yyyy)".
- Gender:** A dropdown menu with "F" selected.
- Date of Accident:** Three dropdown menus for day (1), month (1), and year (1997), followed by the text "(dd mm yyyy)".
- Date of arrival at the hospital:** Three dropdown menus for day (1), month (1), and year (2000), followed by the text "(dd mm yyyy)".
- Location:** A dropdown menu with "Foreign Body in the trachea, bronchi and lungs (ICD934)" selected.
- specify:** A dropdown menu with "Foreign body in the bronchi (ICD934.1)" selected.
- specify:** A dropdown menu with "left" selected.
- Were there complications?:** A dropdown menu with "Yes" selected, followed by a text input field and a "specify:" dropdown menu.
- How was the foreign body removed?:** A dropdown menu with "Other" selected, followed by a text input field and a "specify:" dropdown menu.
- Was the child suffering from a mental disorder or a handicap at the moment of the accident?:** A dropdown menu with "Yes" selected, followed by a text input field and a "specify:" dropdown menu.
- Did the child survive the accident?:** A dropdown menu with "No" selected.

At the bottom of the window are three buttons: "Previous", "Save", and "Next".

Location (ICD9 code):  
931-935

Ears, nose, inhalation and ingestion

Presence of complications  
Basic characteristics of the child

# Details about the extracted Foreign Body

Type  
Shape  
Consistency  
Axis' length (diameter)  
FB association  
with other objects

The screenshot shows a software window titled "Susysafe Case Report" with a menu bar containing "File", "Backup", and "Help". The main content area is titled "Foreign Body Typology" and contains the following fields:

- Type of foreign body:
- Brand of foreign body:
- Shape:  dimension (mm):
- Consistency:
- Was the foreign body purchased or a part of an object purchased?
- If yes, when purchased, was the FB packed with another object(s)?
- If yes, of what type?  specify:
- At the time of the accident was the FB associated with another object(s)?
- If yes, of what type?  specify:

At the bottom of the window are three buttons: "Previous", "Save", and "Next".

# Susysafe Case Report software (SCR)

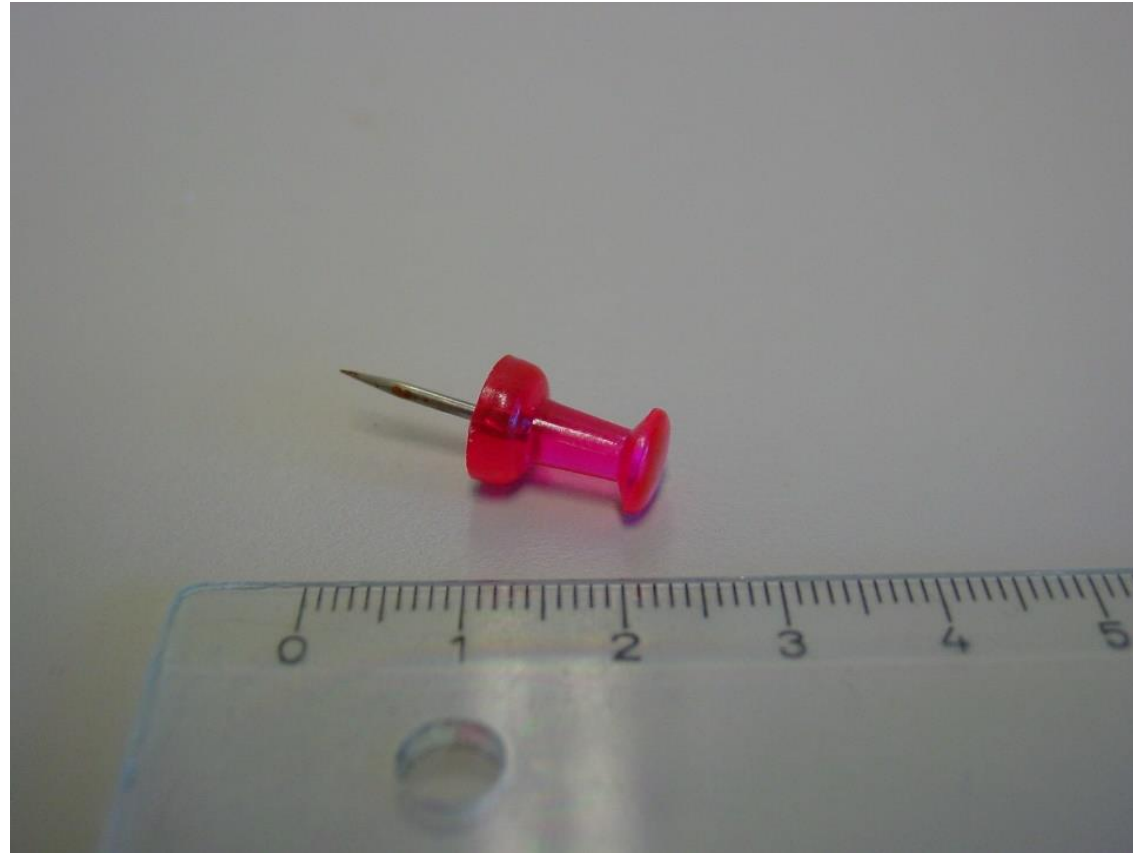
- circumstances of the accident
  - Adult presence
  - Child's activity at the moment of the accident
- hospitalization details
  - The department that initially look for the child
  - Hospitalization period
- FB physical details
  - Picture of the FB
  - Cylinder test data
  - Actual volume of the FB

The screenshot shows the 'Susysafe Case Report' application window. It features a menu bar with 'File', 'Backup', and 'Help'. The main content is organized into sections: 'Circumstances of the accident' with dropdowns for 'When the accident occurred was an adult present?' (set to 'Yes') and 'When the accident occurred the child was:' (set to 'Other'), followed by a 'specify:' text box. The 'Hospitalization details' section includes 'Who initially looked after the child?' (set to 'Other') with a 'specify:' text box, and 'Was the child hospitalised?' (set to 'Yes') with a 'Lasting:' text box for days. The 'Foreign Body Tests' section has a dropdown for 'Did the FB passed the Cylinder test?'. At the bottom, there is an 'Upload the picture of the FB:' field with a 'Browse' button, a 'Comments:' text area, and three buttons: 'Previous', 'Save', and 'Submit'.

# Bead from the nose



# Drawing pin from the right lung



# Plastic nut from the oral cavity of a 9 month old baby

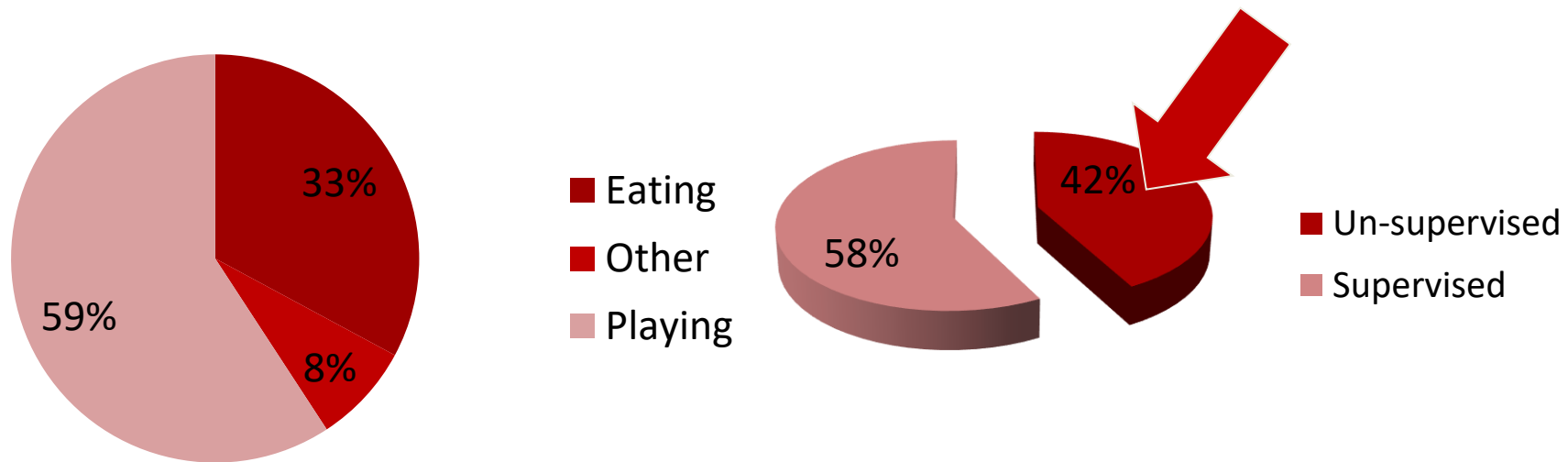


# Safety pin from the esophagus





# Activity and supervision

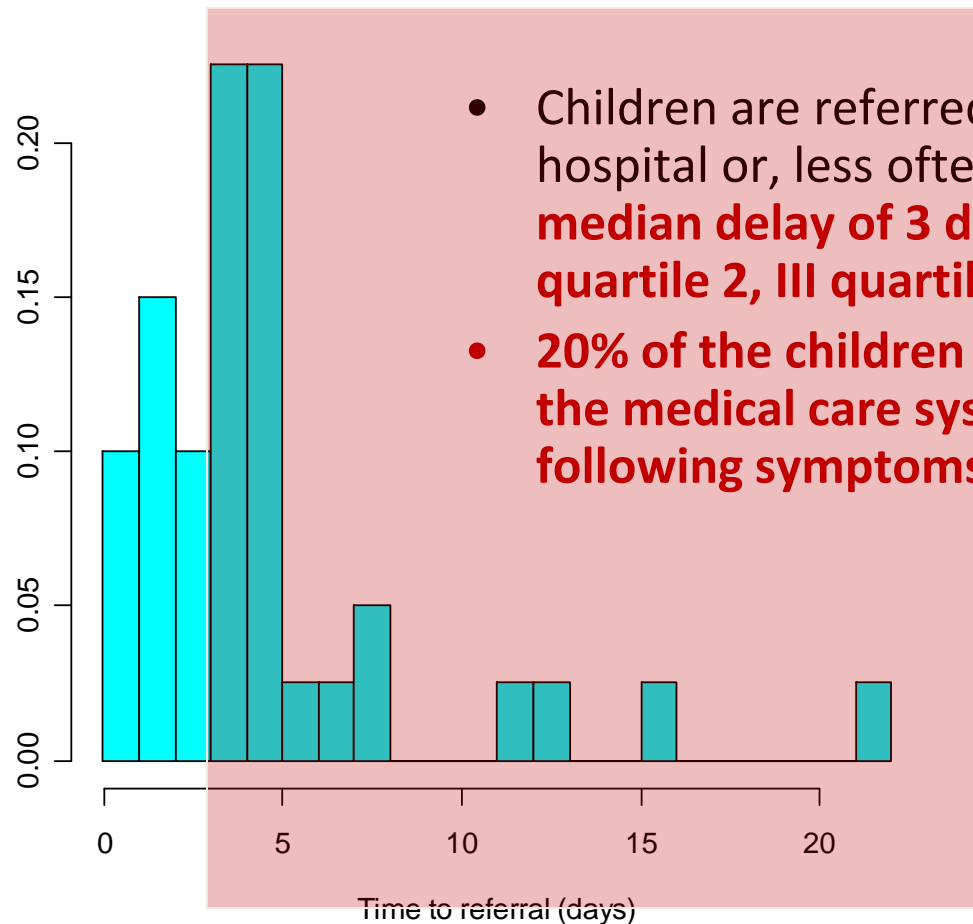


	Eating	Other	Playing
<b>Un-supervised</b>	14.10%	51.90%	56.40%
<b>Supervised</b>	<b>85.90%</b>	48.10%	43.60%

# Medical awareness: the MagDb experience



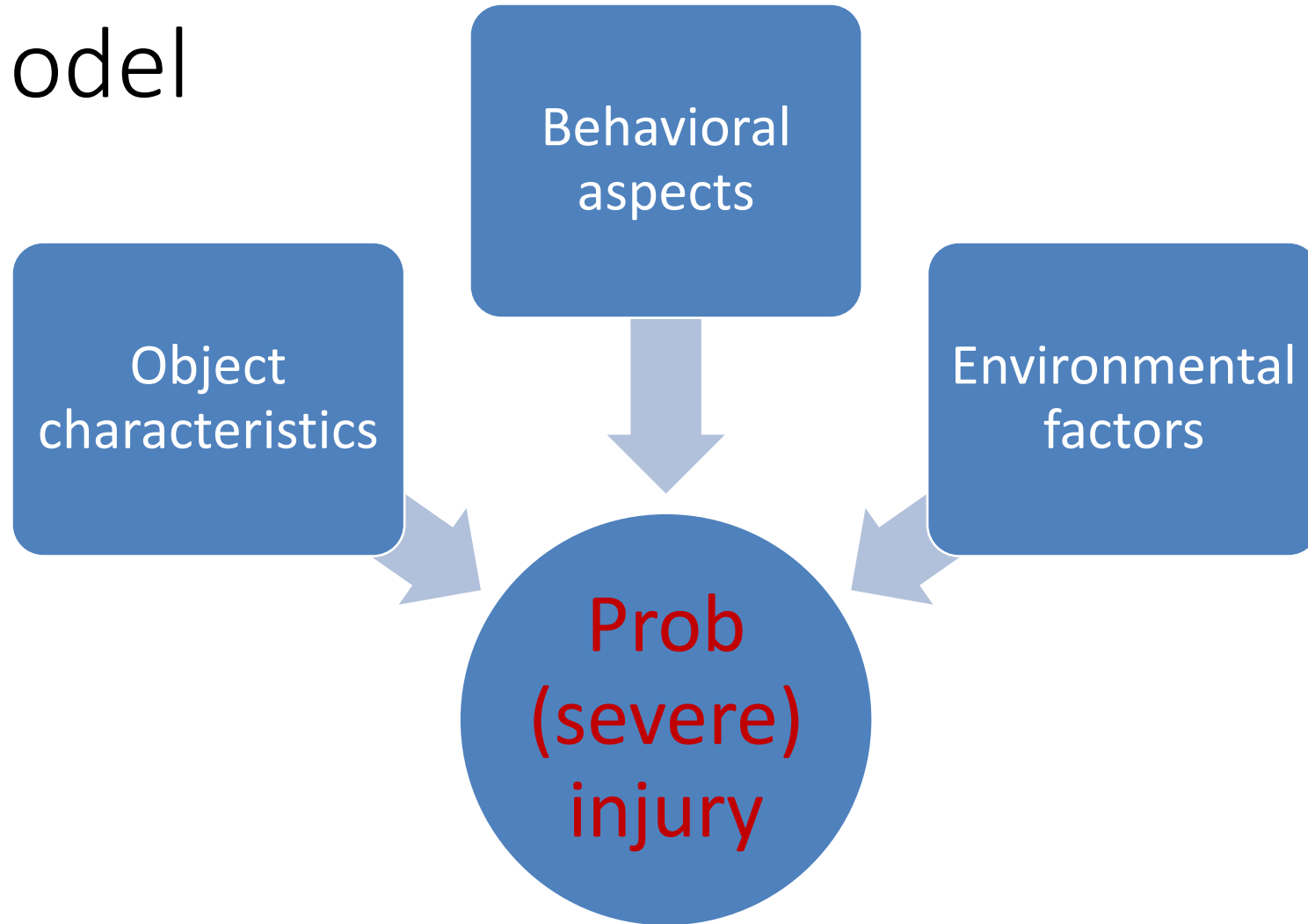
# Referral to the medical care system



- Children are referred to the medical care system (the hospital or, less often, the general practitioner) with a **median delay of 3 days after onset of symptoms (I quartile 2, III quartile 4.5)**
- **20% of the children are referred with great delay to the medical care system only after a number of days following symptoms onset between 14.4 and 29.1**

Gregori D., Morra B., Gulati A., Magnetic FB injuries: An old yet unresolved hazard, IJPORL76S (2012) S42–S48


# Risk Model



# Estimating the risks (Machine-Learning Based Risk Engine)

The Susy Safe project

The Susy Safe project



**susy safe** project

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### Product Risk Estimation

Europe Country:  (Please choose)

Overall Age Class:  (Please choose)  
Gender:  (Please choose)  
FB Type:  (Please choose)  
Location:  (Please choose)

Shape:  (Please choose)

Volume:  (Please enter a value)  Average SS

Elipticity (Diameter Ratio):  (Please enter a value)  Average SS

Consistency:  (Please choose)

Probability of injury in trachea, bronchi and lungs, due to 2D circle object < 39.47 mm<sup>3</sup> (approx coin)



**Credibility intervals**

Risk of injury (E-04)

80%	→	1.657 - 1.714
90%	→	1.641 - 1.731
95%	→	1.626 - 1.743
99%	→	1.601 - 1.769

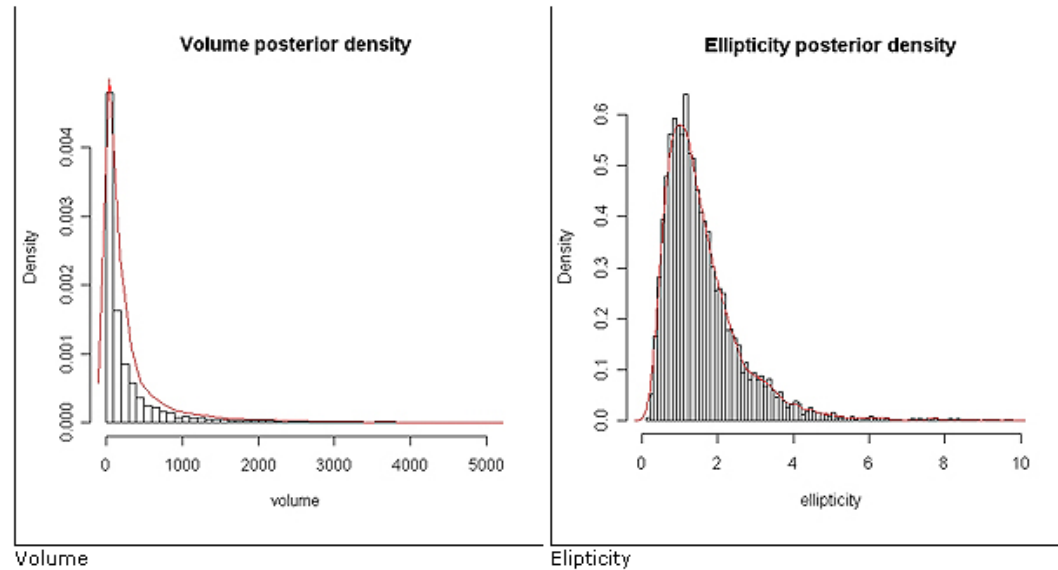
**Risk estimate<sup>1</sup> 0.000168**  
**Risk estimate<sup>2</sup> for Greece 0.000132**

**Credibility intervals**

Conditional risk of severe injury (at list one day of hospitalization)

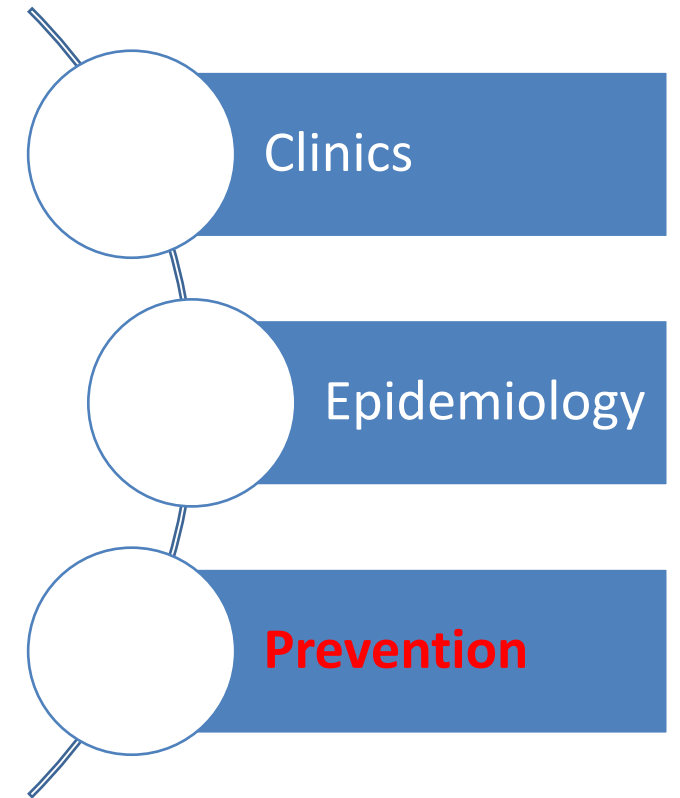
80%	→	0.266 - 0.275
90%	→	0.263 - 0.278
95%	→	0.261 - 0.280
99%	→	0.257 - 0.284

Conditional probability based on observed cases



<sup>1</sup>SS data

<sup>2</sup>Papadopoulos 2004



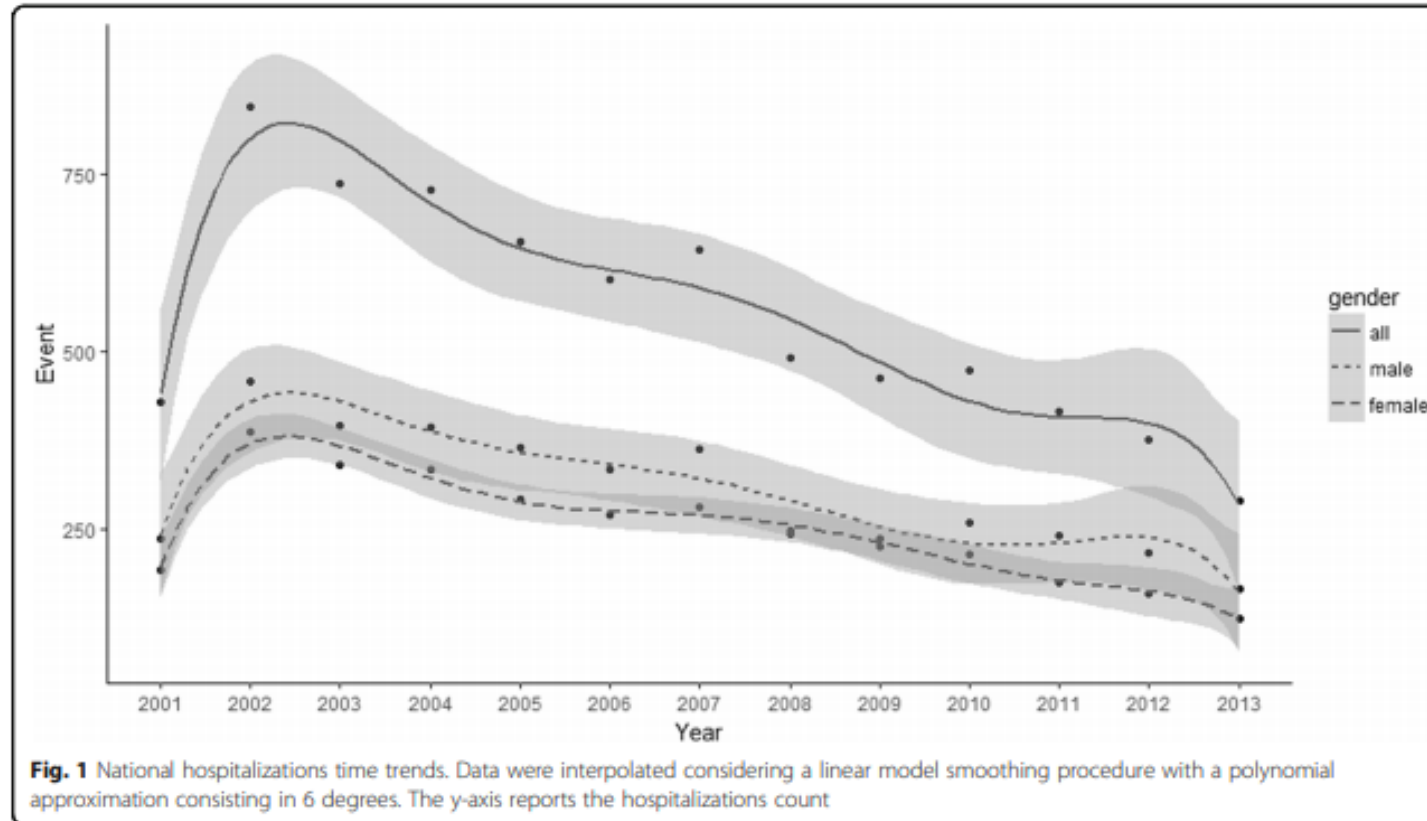


# Prevention works ...

## Temporal and regional trends of choking injuries in children in Italy, 2001–2013



Giulia Lorenzoni<sup>1</sup>, Danila Azzolina<sup>1</sup>, Nicola Soriani<sup>1</sup>, Marco Galadini<sup>2</sup>, Flavia Carle<sup>3</sup> and Dario Gregori<sup>1\*</sup>



# THANKS!

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