



Animal Health Matters.  
For Safe Food Solutions.



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,  
Education and Research EAER  
**State Secretariat for Economic Affairs SECO**

# Database development and use

Marco De Nardi (ILE, SAFOSO, MSP)

Viktoria Lets (NLE, SAFOSO, MSP)



# Objectives

- Data management
- Data storage
- Database development
- Some examples of veterinary databases and information systems



# Data management

- Data are **meaningless** unless it can be analysed to obtain information
- Data analysis requires data that is **correct** and **well organised** in a carefully designed system
- A **properly organised system** allows you to update and retrieve data as and when necessary



# Data management



# Data management

## Working with data can generally be divided into distinct parts:

- Survey design (not always)
  - Data collection
  - Data entry
- } SOURCE of DATA
- **Data cleaning and checking**
  - **Manipulation and visualization of the data (graphs, tables, descriptive statistics)**
  - **Statistical analysis of the data (including Spatial Analysis)**



# Data collection

Data are collected in three main ways, by:

1. **observation** (e.g., clinical examination, diagnostic imaging and post-mortem examination);
2. completing **questionnaires** (either directly or by interview);
3. use of **documentary sources** (e.g., clinical records, and records of diagnostic laboratory results), with an increasing use of data sets generated by other workers.



# Data storage

**Database** is a structured collection of data which is the basis of an organized data storage and retrieval system.



# Database development

Database\_farmer\_Final - Excel

Viktoria Lets

Файл Главная Вставка Разметка страницы Формулы Данные Рецензирование Вид Foxit PDF Что вы хотите сделать? Общий доступ

Буфер обмена Шрифт Выравнивание Число

Общий

Условное форматирование Форматировать как таблицу Стили

Вставить Удалить Формат

Сортировка Найти и фильтр выделите Редактирование

L2 adult

	A	B	D	E	F	G	H	I	J	K
1	Farmer	Country	Location (English)	Merz	Outbreak (2007-2015)?	Repeated outbreaks (>1 outbreaks)?	Year of last outbreak	Date interview	Age	Age_cat
2	1	Armenia	Sevan-Norashen	Gegharkunik	1	1	2008	13.09.2015	40	2
3	2	Armenia	Varsar	Gegharkunik	1	1	2008	20.09.2015	54	3
4	3	Armenia	Sevan-Norashen	Gegharkunik	1	1	2008	13.09.2015	30	2
5	4	Armenia	Zovaber	Gegharkunik	1	1	2008	05.09.2015	57	3
6	5	Armenia	Zovaber	Gegharkunik	1	1	2008	05.09.2015	37	2
7	6	Armenia	Zovaber	Gegharkunik	1	1	2008	05.09.2015	41	2
8	7	Armenia	Zovaber	Gegharkunik	1	1	2008	05.09.2015	48	2
9	8	Armenia	Chkalovka	Gegharkunik	1	1	2008	30.09.2015	50	3
10	9	Armenia	Chkalovka	Gegharkunik	1	1	2008	20.09.2015	44	2
11	10	Armenia	Chkalovka	Gegharkunik	1	1	2008	15.09.2015	40	2
12	11	Armenia	Chkalovka	Gegharkunik	1	1	2008	10.09.2015	45	2
13	12	Armenia	Sevan	Gegharkunik	1	1	2008	06.09.2015	55	3
14	13	Armenia	Sevan	Gegharkunik	1	1	2008	15.08.2015	40	2
15	14	Armenia	Sevan	Gegharkunik	1	1	2008	20.09.2015	38	2
16	15	Armenia	Sevan	Gegharkunik	1	1	2008	05.09.2015	50	3
17	16	Armenia	Sevan	Gegharkunik	1	1	2008	10.09.2015	45	2
18	17	Armenia	Geghamavan	Gegharkunik	1	1	2008	10.09.2015	49	2
19	18	Armenia	Sevan	Gegharkunik	1	1	2008	21.09.2015	55	3
20	19	Armenia	Lchashen	Gegharkunik	1	1	2008	10.09.2015	50	3
21	20	Armenia	Lchashen	Gegharkunik	1	1	2008	15.09.2015	40	2
22	21	Armenia	Lchashen	Gegharkunik	1	1	2008	24.09.2015	51	3
23	22	Armenia	Lchashen	Gegharkunik	1	1	2008	20.09.2015	45	2
24	23	Armenia	Lanjär	Ararat	1	1	2008	12.09.2015	NA	NA
25	24	Armenia	Eghegnavan	Ararat	1	1	2008	13.09.2015	26	1
26	25	Armenia	Poqr Vedi	Ararat	1	1	2008	12.09.2015	30	2
27	26	Armenia	Urcalanj	Ararat	1	1	2008	12.09.2015	62	3
28	27	Armenia	Ararat	Ararat	1	1	2008	18.09.2015	60	3
29	28	Armenia	Ararat	Ararat	1	1	2008	11.09.2015	50	3
30	29	Armenia	Ararat	Ararat	1	1	2008	09.09.2015	NA	NA
31	30	Armenia	Ararat	Ararat	1	1	2008	12.09.2015	39	2

Готово Количество: 4 70%

Windows taskbar: 15:45 05.10.2016





# Recording techniques

## 1. Longhand recording techniques

- Day books
- Record cards
- Punched card recording techniques
- Item cards
- Feature cards



# Recording techniques

## 2. Computerized recording techniques

- Excel
- Epidata <http://www.epidata.dk/>
- SurveyMonkey <https://ru.surveymonkey.com/>
- Microsoft Access <https://products.office.com/uk-ua/access>
- Google docs  
<https://docs.google.com/forms/d/e/1FAIpQLSfb5tbMNWQKB27rIM8HxvTrqAkXryKyS4tPKOAhzBV8-XMSVA/viewform?c=0&w=1>



# Data cleaning-practical suggestions 1

- Database **name**...not too long
- **Languages**....consistent across all fields and entries
- Unique **spreadsheet**
- Each **column** and **rows** with unique names
- Unique **ID identifier** (.... to join tables!)



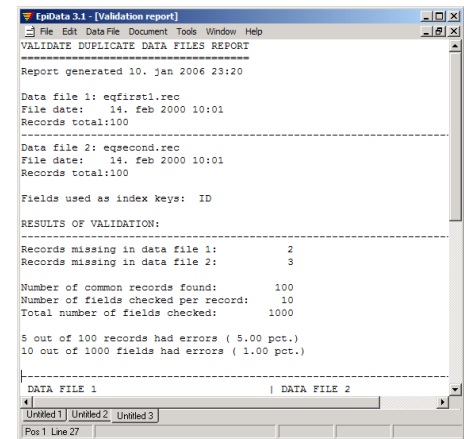
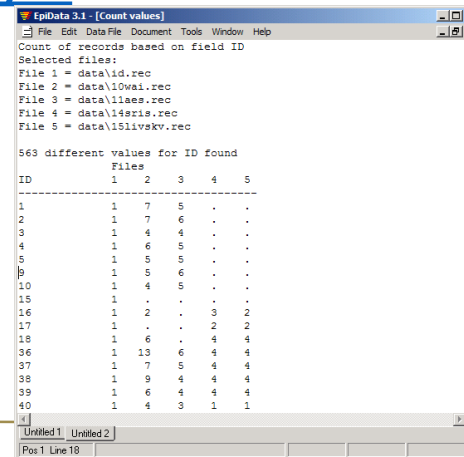
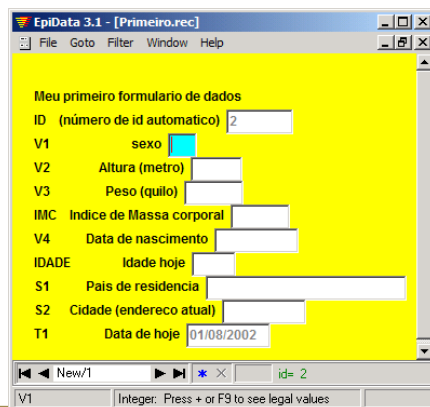
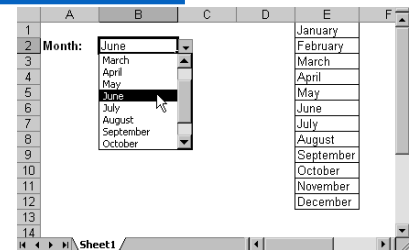
# Data cleaning-practical suggestions2

- Right **entries** in the right columns? (... «age» in «sex» column)
- Check **format** of entries (are number in «number» format? (... «results»))
- **Standardization** of entries (...«female» ; «femmale»; «fem»)
- Check for **missing values** (...why are missing?)



# Data cleaning: check for errors-mistakes1

- Double entry : work in parallel and compare
- Automatic systems in data entry (e.g. set up drop down menu)
- <http://office.microsoft.com/en-us/frontpage-help/add-a-drop-down-box-or-menu-to-a-form-HP005259117.aspx?CTT=1>
- Epi-data <http://www.epidata.dk/#>



# Data cleaning: check for errors-mistakes 2

- If mistakes, uncertainties, missing values are found...

## Check the SOURCE of DATA:

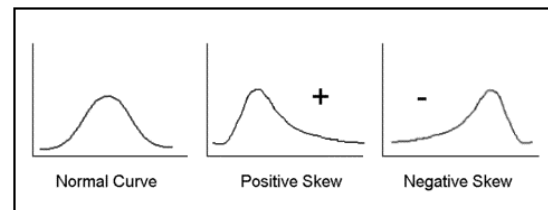
- Questionnaires
- Original datasets
- Talk to members involved in the survey
- Talk to members involved in data entry

***NBB. Data cleaning (and data organization) are fundamental steps as they help to get a «**feeling**» of the data (the more important is you were not involved in the data collection process)***



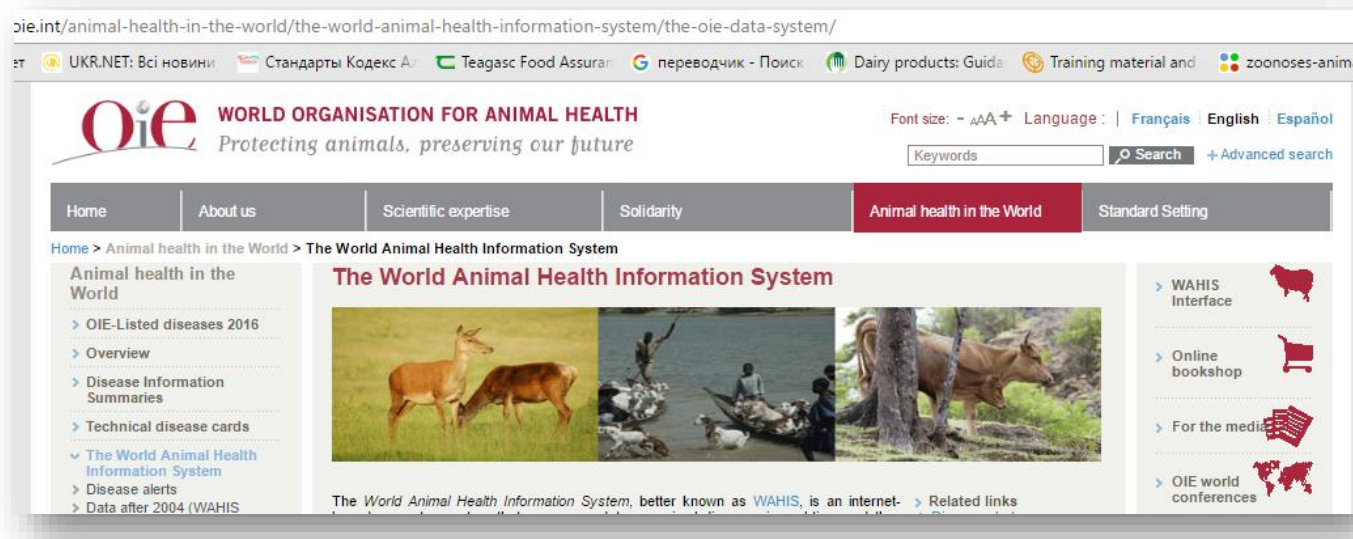
# Manipulation-reorganization of data

- Start thinking what you want to show in a map
  - Which is the epidemiological unit? (single animals, herds?)
  - Show sampling units location, outbreaks cases, cluster of disease ?
  - Scale? Administrative units? (all mongolia, selected sums?)
- Organization of entries: categorization? (prevalence, age, temperatures etc..)
  - Choose the right categories (biologically meaningful)
  - «Normal» versus «skewed» distribution (check outliers etc...)



# Some examples of veterinary databases and information systems

## The Office International des Epizooties (OIE) international disease reporting system



### The objectives of OIE are:

- to alert countries threatened by an epidemic;
- to strengthen international co-operation on animal disease control;
- to facilitate international trade.





# Some examples of veterinary databases and information systems

## NAHMS (National Animal Health Monitoring System)

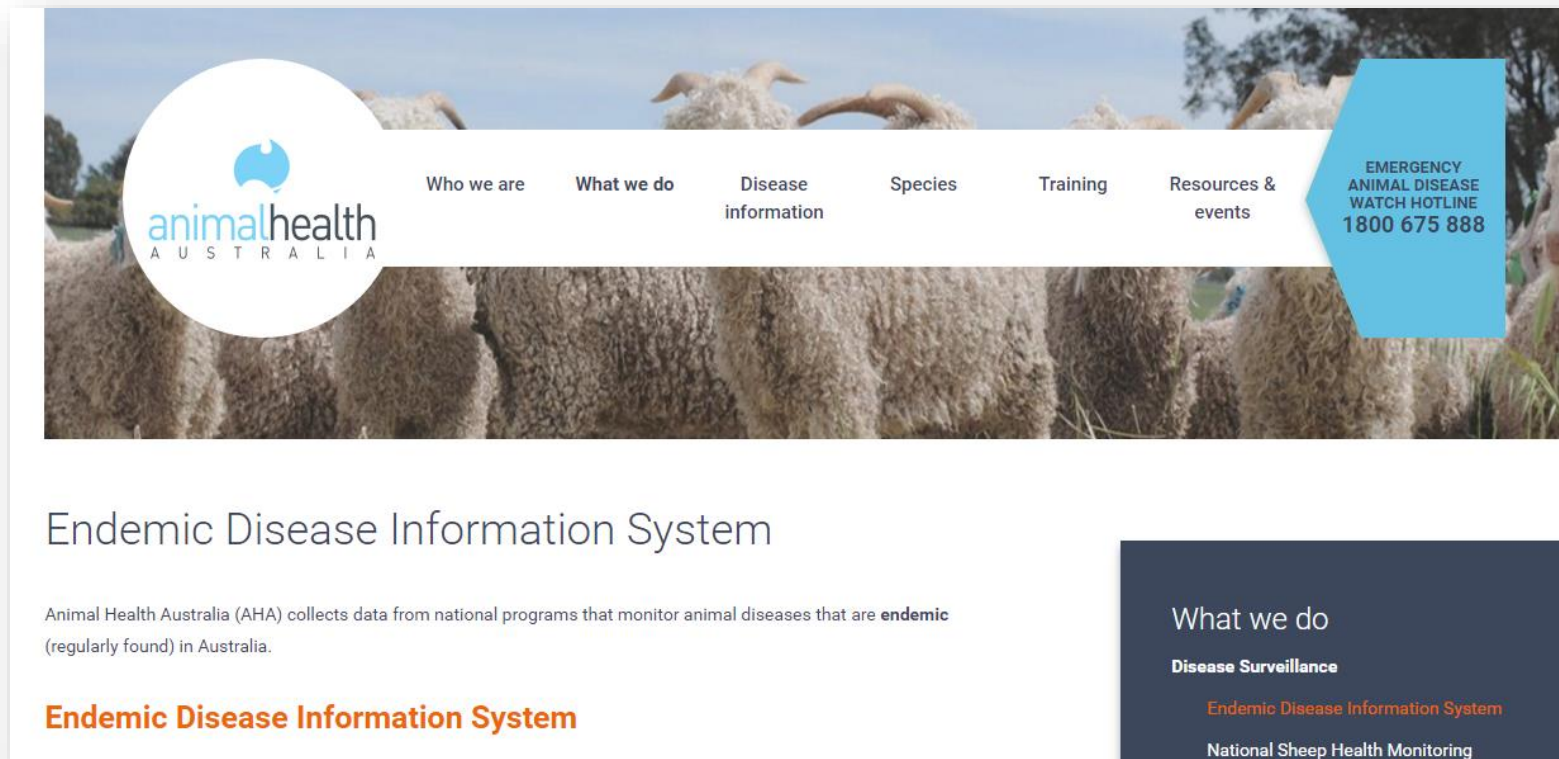
is a macroscale system, designed to measure the incidence, prevalence and cost of health-related events in livestock in the US, and to identify determinants of disease in modern production systems.

The screenshot shows the USDA website for the National Animal Health Monitoring System (NAHMS). The header includes the USDA logo, the text "United States Department of Agriculture" and "Animal and Plant Health Inspection Service", and navigation links for "About APHIS", "Ask The Expert", "Careers", "Contact Us", and "Help". A search bar is located on the right. Below the header is a green navigation bar with links for "Home", "Our Focus", "Resources", "Newsroom", "Pet Travel", and "Blog". Social media icons for RSS, email, Facebook, Twitter, and YouTube are also present. The main content area features a breadcrumb trail: "Animal Health / Monitoring and Surveillance / NAHMS". On the left is a sidebar menu with "Animal Health" (selected), "Contact Us", "Program Overview", "Animal Disease Information", and "Emergency Management". The main heading is "National Animal Health Monitoring System (NAHMS)", with a "Last Modified: Sep 21, 2016" date and a "Print" button. The introductory text states: "The National Animal Health Monitoring System (NAHMS) Program Unit conducts national studies on the health and health management of United States domestic livestock and poultry populations. More about NAHMS...". A "Related Links" section is partially visible at the bottom right.



# Some examples of veterinary databases and information systems

## Endemic Disease Information System



The screenshot shows the Animal Health Australia website. At the top, there is a navigation menu with the following items: "Who we are", "What we do", "Disease information", "Species", "Training", and "Resources & events". The "Disease information" item is highlighted. To the right of the navigation menu, there is a blue call-to-action box that reads "EMERGENCY ANIMAL DISEASE WATCH HOTLINE 1800 675 888". Below the navigation menu, the main heading "Endemic Disease Information System" is displayed. Underneath this heading, a paragraph states: "Animal Health Australia (AHA) collects data from national programs that monitor animal diseases that are **endemic** (regularly found) in Australia." Below this paragraph, the title "Endemic Disease Information System" is repeated in a larger, bold font. On the right side of the page, there is a dark blue sidebar with the heading "What we do" and the sub-heading "Disease Surveillance". Under "Disease Surveillance", two items are listed: "Endemic Disease Information System" and "National Sheep Health Monitoring".





Animal Health Matters.  
For Safe Food Solutions.



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,  
Education and Research EAER

**State Secretariat for Economic Affairs SECO**

# Thanks