

# Van een doktersattest naar een nationaal intermutualistische databank met SAS

-

## De l'attestation du médecin vers une banque de données nationale et intermutualiste avec SAS

Véronique de Vooght, Program Manager  
Ragna Préal, BU-IT & EPS coördination

# Agenda

- What is the Intermutualistic Agency?
- Which are the data flows? How was SAS implemented?
- A concrete example?
  - >>The permanent sample

# What is the Intermutualistic Agency?

# IMA – AIM : Foundation

- Non-profit organization
- Founded in 2002
- 7 Belgium Health Insurance Organizations
- Statutory orders and commitments

# IMA – AIM : Objective

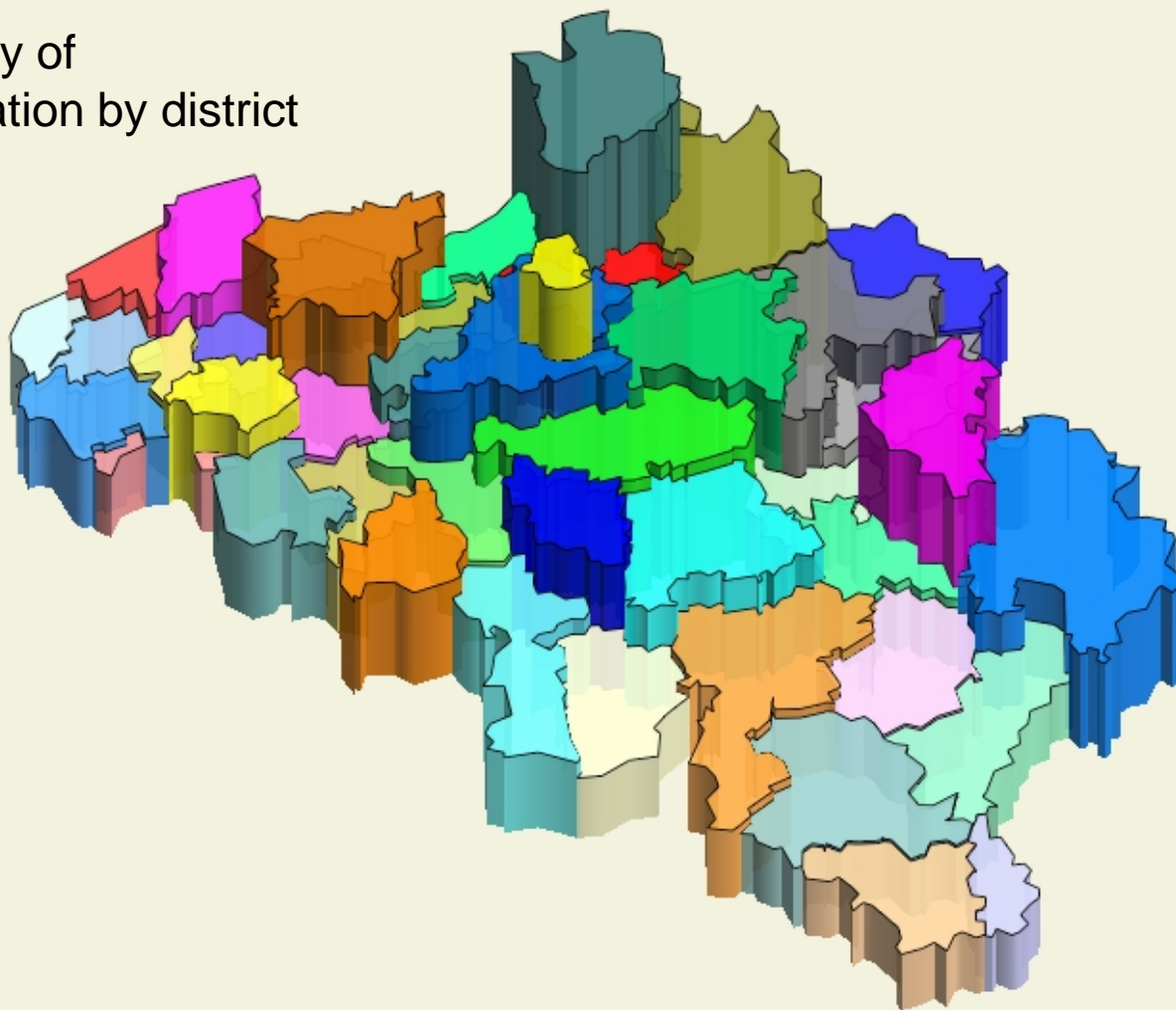
- Through analyzes and studies
  - Support the role of health insurance
    - For maintaining and improving the performance of health care and health insurance in Belgium

# IMA – AIM : Strenghts

- Detail registration of care consumption
  - ⇒ Consultation, Hospital, Medication, Nursing, Physiotherapy, Laboratory exams, ...
- Detail registration of demographic information
  - ⇒ Age, Sex, NIS, Statistic Sector, OMNIO-status, ...
- Privacy & security

# IMA – AIM : Strenghts

Density of  
population by district



# IMA – AIM : Strenghts

- Representativeness of the data
  - ⇒ All insured members = 99% Belgian population
- Longitudinal data :
  - ⇒ Data available from 2002
- Ability to enrich the data with external data sources:
  - ⇒ Belgian Cancer Registry, NIS-INS, Minimal clinical data, ...
- Expertise of staff

# IMA – AIM : With and for whom

- The health insurance organizations
- The governmental partners:
  - RIZIV - INAMI
  - KCE
  - PLANbureau – Bureau du PLAN
  - FOD - SPF
  - WIV - ISP
- The communities
- Universities, ...

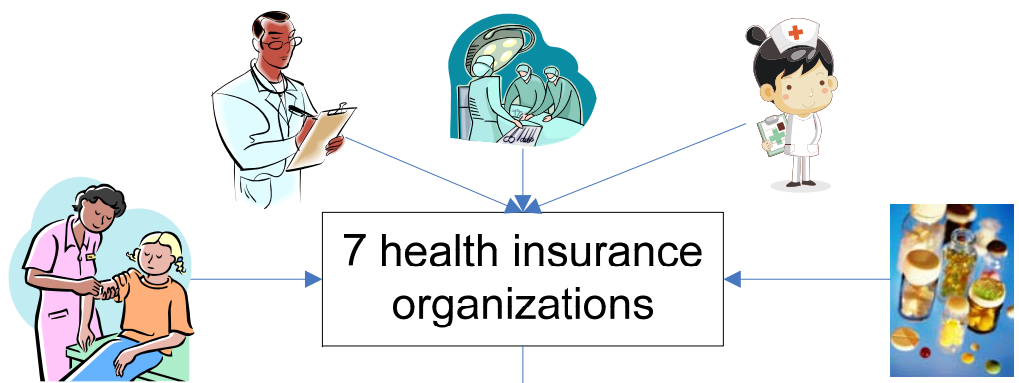
# IMA – AIM : 2009

- 34 projects
  - Example : Evolution of breast cancer screening, Vaccination coverage, ...
- 26 staff members
  - Coordination : 5
  - Projects staff : 21



# Which are the data flows?

# How was SAS implemented?



7 health insurance organizations

Sending flat files

TTP

- receiving files
- reading files
- coding/anonymisation
- control of content and format
- data manipulation
- charging and formatting sas tables

Transfer of data

IMA  
(data control, data selection, aggregation, ...)

- control of data
- data manipulation

Open access

Researchers  
(IMA, KCE, RIZIV, Universities, BCR, ...)

- data analysis
- creation of results
- reporting

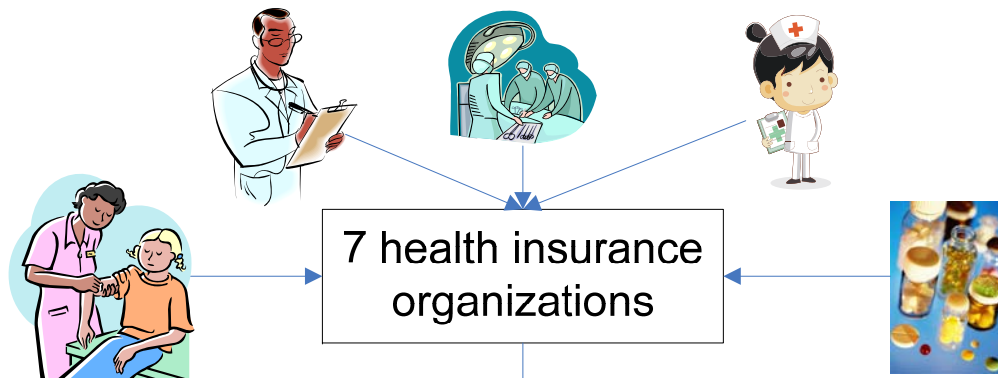
Cancer registry

---

NIS - INS

---

Technische cel volksgezondheid  
Cellule technique santé public



7 health insurance organizations

Sending flat files

- SAS
- SAS DI
  - SAS BI
  - SAS Foundations
  - SAS Enterprise Guide
  - SAS tabellen
  - SAS views

TTP

- receiving files
- reading files
- coding/anonymisation
- control of content and format
- data manipulation
- charging and formatting sas tables

Transfer of data

IMA  
(data control, data selection, aggregation, ...)

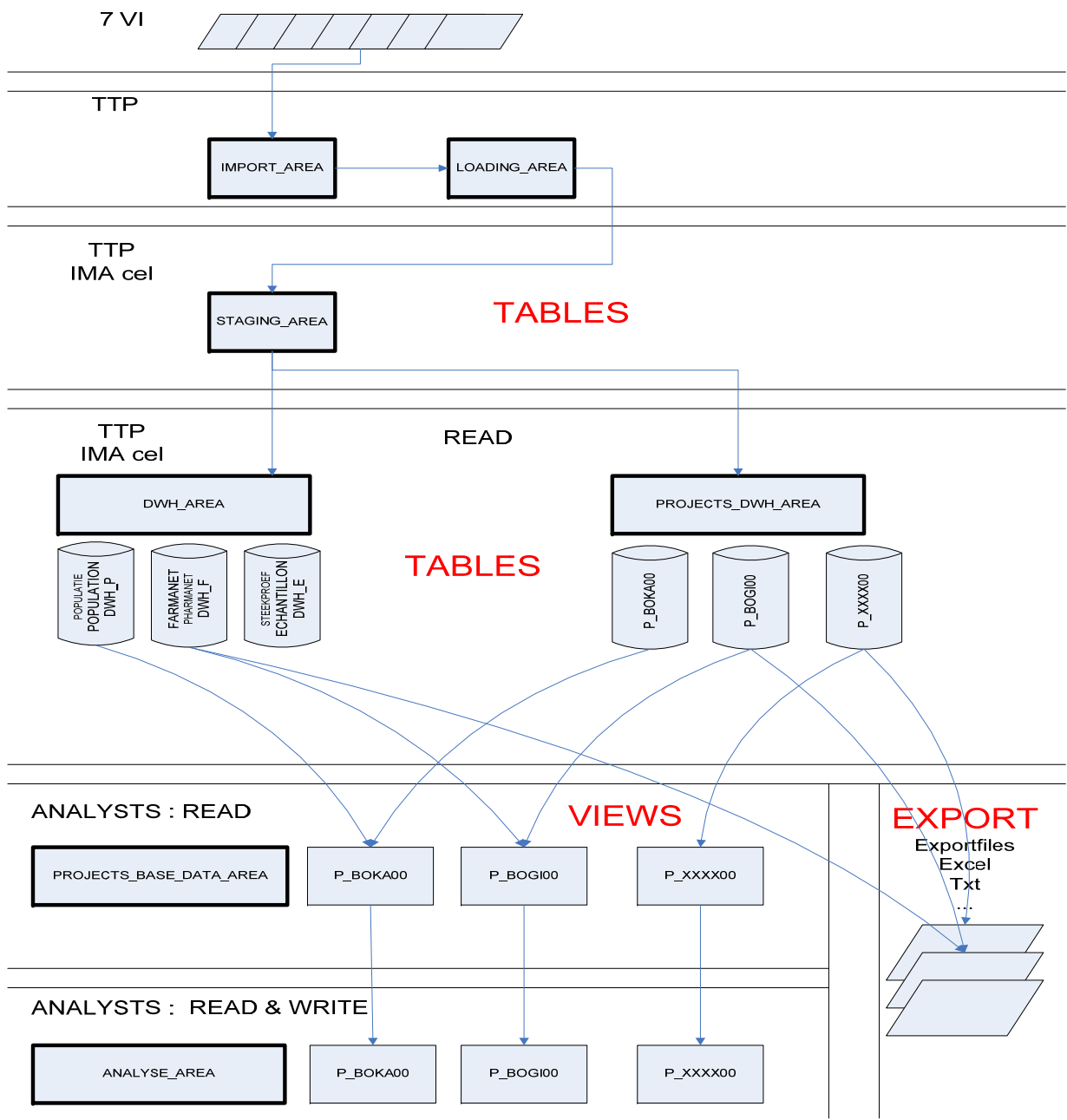
- control of data
- data manipulation

Open access

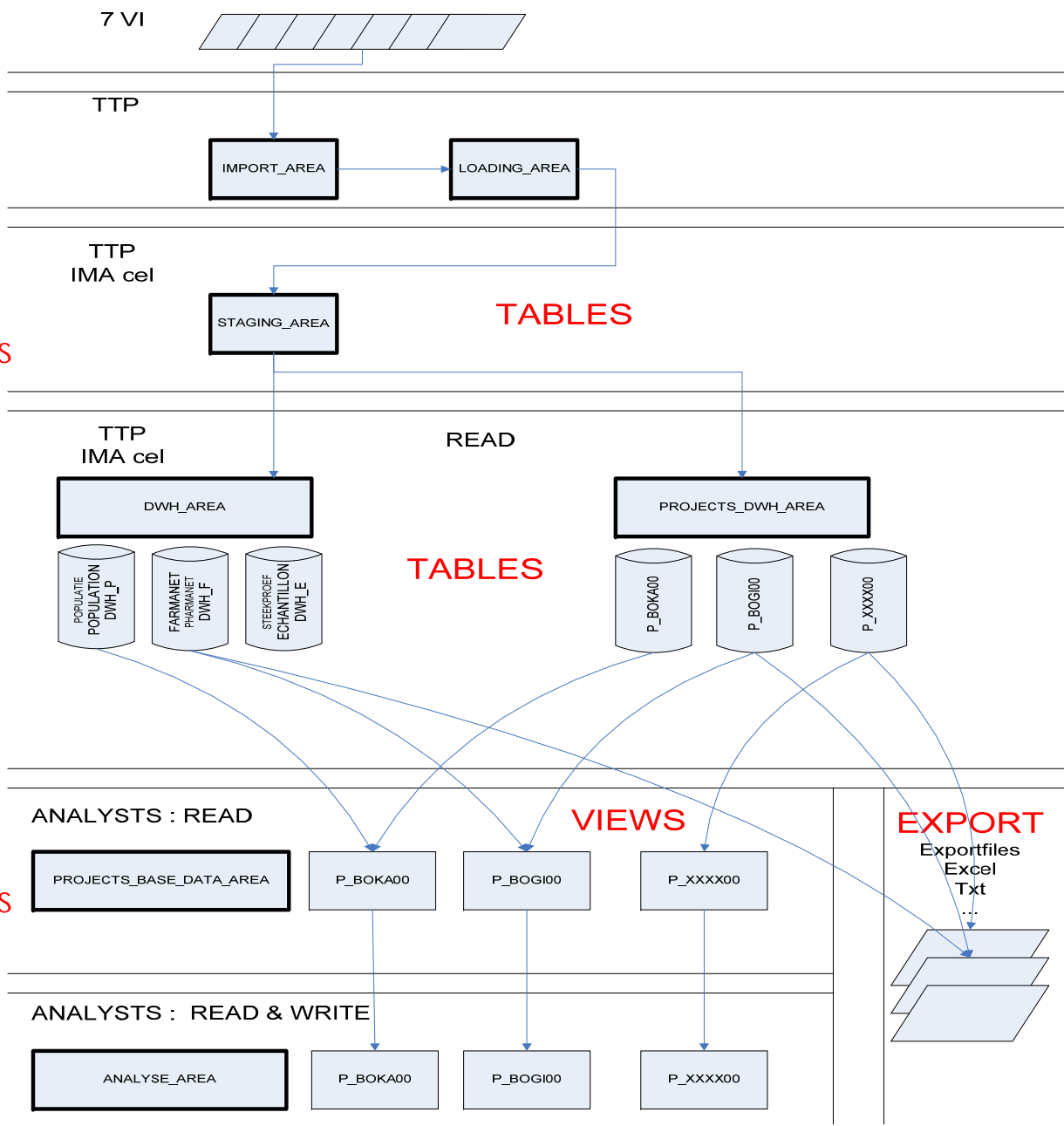
Researchers  
(IMA, KCE, RIZIV, Universities, BCR, ...)

- data analysis
- creation of results
- reporting

Cancer registry
NIS - INS
Technische cel Volksgezondheid Cellule technique santé publique



SAS DI



SAS DI  
SAS  
Foundations

SAS  
Foundations

SAS  
Foundations  
Enterprise  
guide  
SAS BI

Security on  
system level

# A concrete example?

## The permanent sample



Echantillon Permanent(e) Steekproef

# EPS : Definition

- Instrument to study and monitor healthcare consumption and expenditure in Belgium
- Designed by IMA-AIM and the governmental partners
- An essential tool helping public health authorities and stakeholders making better-informed decisions
- Royal decree

# EPS : For who?

- Official partners: IMA-AIM, KCE, RIZIV-INAMI, FPB-BFP, FODSZ-SPFSS, FODVG-SPFSP, WIV-ISP
  - Third parties: universities, communities, ...
- => Under supervision of the Privacy commission

# EPS : The making of...

- Based on a theoretical list of social security numbers
  - Random sample : 1/40
    - Proc surveyselec
    - Sexe , Age : year and month of birth
  - Oversample :  $\geq 65$  years: 2/40
- Confrontation of the theoretical list with the real population

# EPS : Advantages

- Yearly dynamics => natural inflow and outflow of births, deaths, migrations and emigrations
- Longitudinal design => 10 years follow up

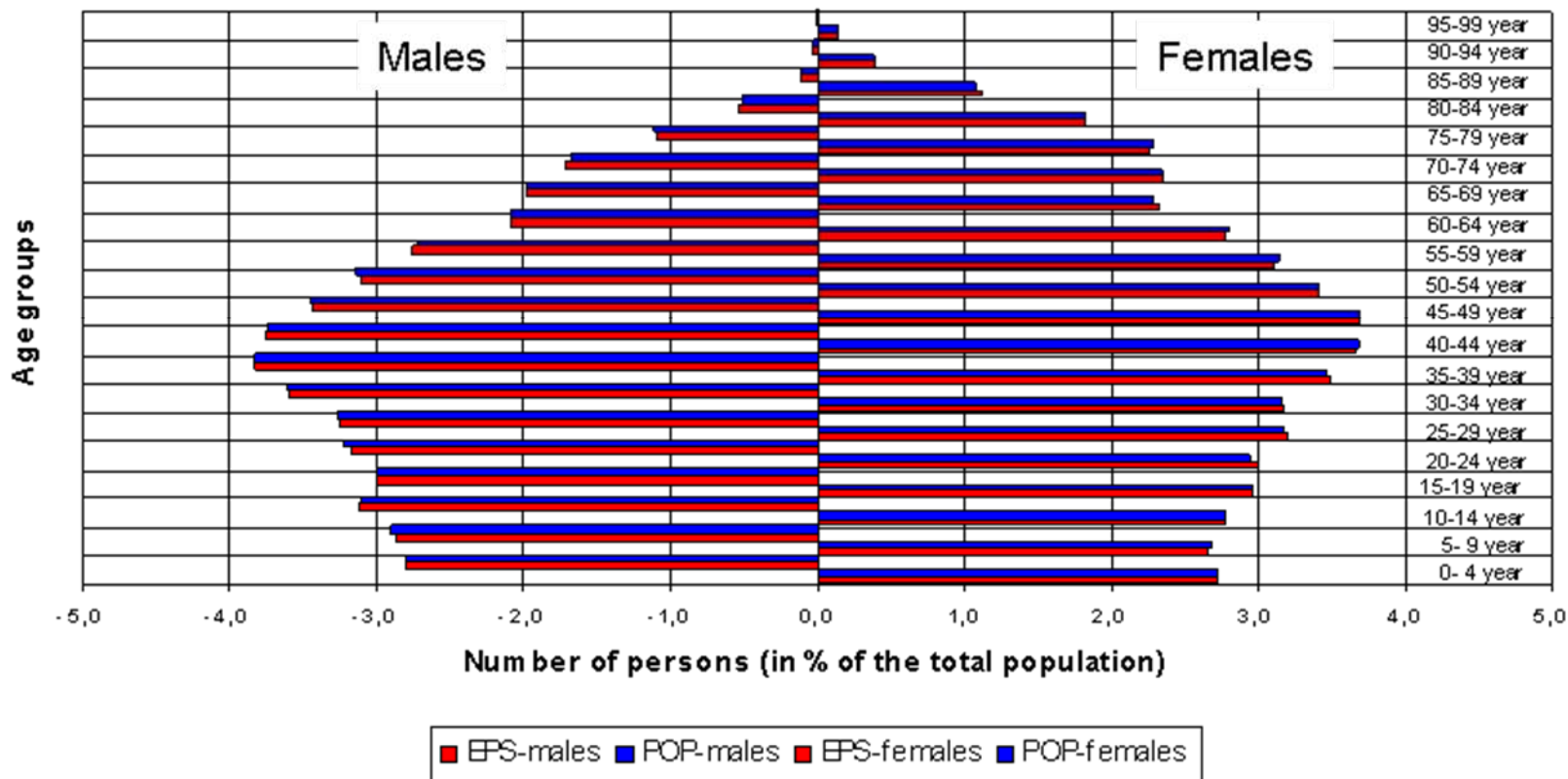
# EPS : Figures

- Data of  $\pm$  305.000 individuals
  - Health care (72var)
  - Pharmacologic items (56var)
  - Socio-demographic indicators (67var)
- Period 2002-2008 , 2009 in February 2011
- Volume:  $\pm$  329 giga – 35.000.000 rows/year

# EPS : Representativeness

## Number of persons by gender and age group

Comparison between the total number of persons (POP) and the extrapolation based on the permanent sample (EPS)



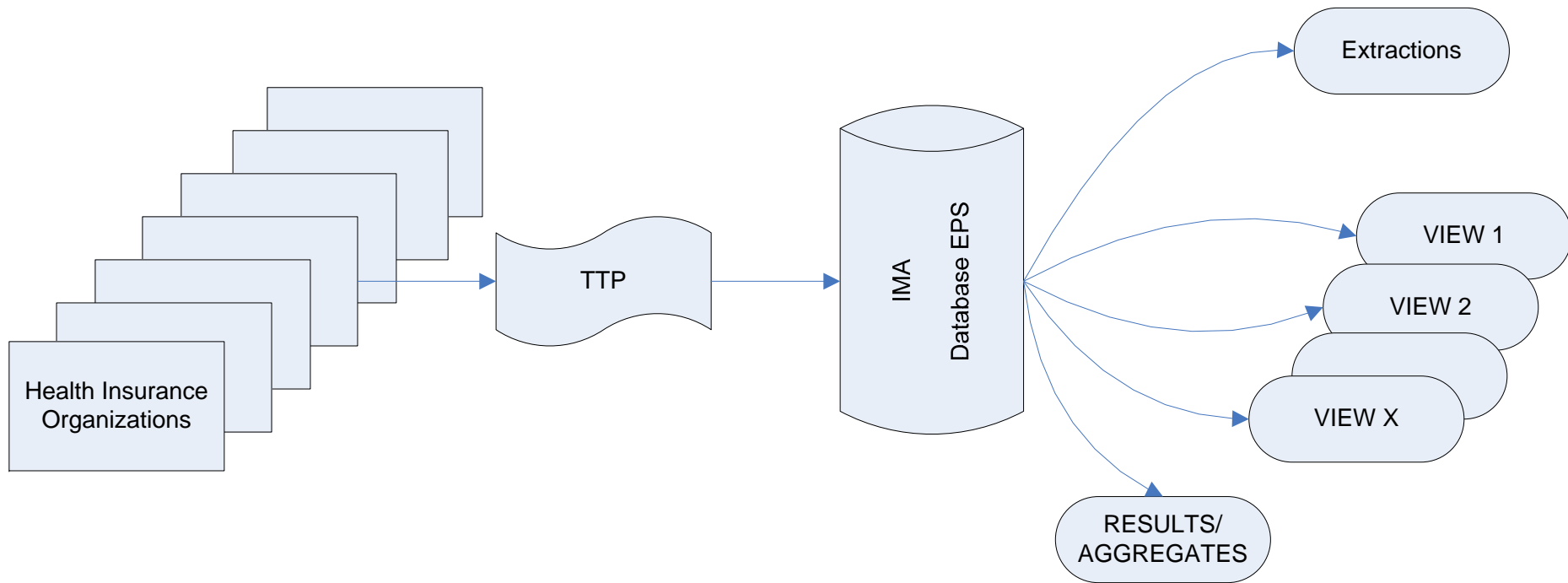
# EPS : Access & Infrastructure

- Partners, actors, projects
- Different SAS versions and tools
  - Version 9.0 till 9.2
  - Tools: SAS Foundations, SAS Enterprise guide
- Different networks & systems :
  - Networks : VPN, Explore...
  - Systems: windows 2000, XP, Vista, 2007

# EPS : Databases

- DATASETS with full detail
- Personal VIEWS with derivate variables
- EXTRACTS datasets
  - Selection of columns and rows
  - Aggregations of the data

# EPS : Data flow



# Conclusion

One visit to the physician, one box of medication, one act of a specialist in the hospital ...one...one...one....

=

A source of data for improving the health care system

# Questions - remarks

[ima-aim@intermut.be](mailto:ima-aim@intermut.be)

[eps@intermut.be](mailto:eps@intermut.be)