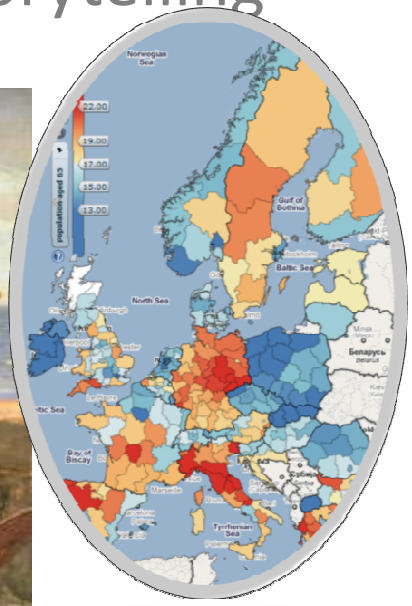
NCVA
National Center for Visual Analytics

ICAS - V
13 - 15 October 2010,
Kampala, Uganda

Analyse, Collaborate and Publish Statistics for Measuring Progress in our Society using Storytelling



IN PARTNERSHIP WITH THE
Knowledge Foundation

NCVA
National Center for Visual Analytics

Agenda

- Massive statistics data …..Interest for regional development and progress is growing;
- Geovisual Analytics – what have we learned and adapted from this research domain;
- Collaborating through Storytelling and Publishing dynamic Visualization in blogs and web pages;
- Some demonstrations;

Massive Statistics Temporal Data available on the Web

But very little methods for sharing knowledge and insight

SCB municipality health related Excel data 2008

	A	B	C	D	E	F	G	H	I	J	K
1	META	CODE	Kommun Namn	döda av alkohol kv	döda av alkohol män	hjärtattack kv	hjärtattack män	död av diabets kv	död av diabets män	socialbidragare	medelålder
2	PARSETYPE	S	S	F	F	F	F	F	F	F	F
3	UNIT	na	na	per 100,000 inv	per 100,000 inv	per 100,000 inv	per 100,000 inv	per 100,000 inv	per 100,000 inv	%	%
4	PRECISION	na	na	1	1	1	1				
5	TIMESTEP	na	2005	2005	2005	2005	2005	200			
6		0114	Upplands Väsby	13,4	55,3	180,2	251,1	6,			
7		0115	Vallentuna	5,4	24,3	114,5	304,3	23,			
8		0117	Österåker	12,8	27,4	91,1	257,3	9,			
9		0120	Värmdö	18,1	59,7	128,4	320,4	2,			
10		0123	Järfälla	12,6	41,4	142,2	280,8	1			
11		0125	Ekerö	12,6	21,2	77,4	223	8,			
12		0126	Huddinge	15,1	44	182,8	327,4	11,			
13		0127	Botkyrka	19	57	219,2	395,1	17,			
14		0128	Salem	7,7	38,1	168,8	275,8	8,			
15		0136	Haninge	12,3	58,8	176,5	315,2	16,			
16		0138	Tyresö	9,2	42,7	157,1	294,6	19,			
17		0139	Upplands-Bro	17,3	61,5	128,2	317	26,			
18		0140	Nykvarn	0	62	141,6	283	9,			
19		0160	Täby	12,7	22,6	122,2	200	8,			

SCB_tidsdata [Kompatibilitetsläge]

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	META	CODE	Kommun Namn	Total Befol	Total Befol	Total Befol	Medelinkomst	Medelinkomst	Medelinkomst	Ekonomiskt bistånd	Ekonomisk	Ekonomiskt bistånd	
2	UNIT	NA	na	personer	personer	personer	tkr	tkr	tkr	%	%	%	
3	PARSETYPE	S	S	F	F	F	F	F	F	F	F	F	
4	PRECISION	na	na	0	0	0	1	1	1	2	2	2	
5	SLICE	na	na	2005	2006	2007	2005	2006	2007	2005	2006	2007	
6		0114	Upplands Väsby	37624	37848	38055	243,6	249,6	259	4,1	4	4	
7		0115	Vallentuna	27397	27868	28382	259,4	267,6	280,5	1,9	1,9	1,7	
8		0117	Österåker	37336	37879	38286	265	274,1	284,8	2,3	1,9	1,7	
9		0120	Värmdö	34933	35803	36870	263,4	272,3	285,2	2,7	2,3	2,3	
10		0123	Järfälla	61743	62342	63427	253,5	260,1	268,8	4,2	4,3	4,1	
11		0125	Ekerö	24010	24301	24687	285,3	293,5	307,6	2,2	2,2	2	
12		0126	Huddinge	88750	90182	91827	241,3	246,9	256,3	5	4,7	4,5	
13		0127	Botkyrka	76592	77553	79031	205,6	210	217,3	5	4,8	4,6	
14		0128	Salem	14334	14715	15065	262,3	268,6	279,7	2,6	2,5	2,6	
15		0136	Haninge	71837	72956	73698	229,3	234,9	242,5	4,7	4,5	4	
16		0138	Tyresö	41134	41476	42047	262,3	271,6	283,9	2,6	2,4	2	
17		0139	Upplands-Bro	21327	21638	22221	235,8	241,7	252	5,3	5,2	4,8	
18		0140	Nykvarn	8354	8609	8926	262,6	271,1	285,6	1,8	1,4	2,4	
19		0160	Täby	60594	61006	61633	317,6	329,6	348,1	1,5	1,3	1,3	
20		0162	Danderyd	30226	30492	30789	391,8	411,4	439,6	0,8	0,8	0,9	
21		0163	Sollentuna	59355	60528	61387	289,4	299,4	314,6	2,7	2,5	2,4	
22		0180										5	
23		0181										10,1	
24		0182										2,9	
25		0183										3,7	
26		0184										2	

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

OECD

THE WORLD BANK
Working for a World Free of Poverty

European Commission
eurostat Your key to European statistics

The World Bank Group
Home | About | Data | Research | Learning
World dataBank

ABOUT | DATA | RESEARCH | LEARNING | NEWS

Data

Countries | Topics | Indicators | Data Catalog

This page in English | Español | Français | العربية

Indicators

Below are 339 indicators which are subsets of the World Development Indicators (WDI) covering 209 countries from 1960 to 2008 translated into Spanish, French and Arabic. To access the full WDI, visit the World DataBank.

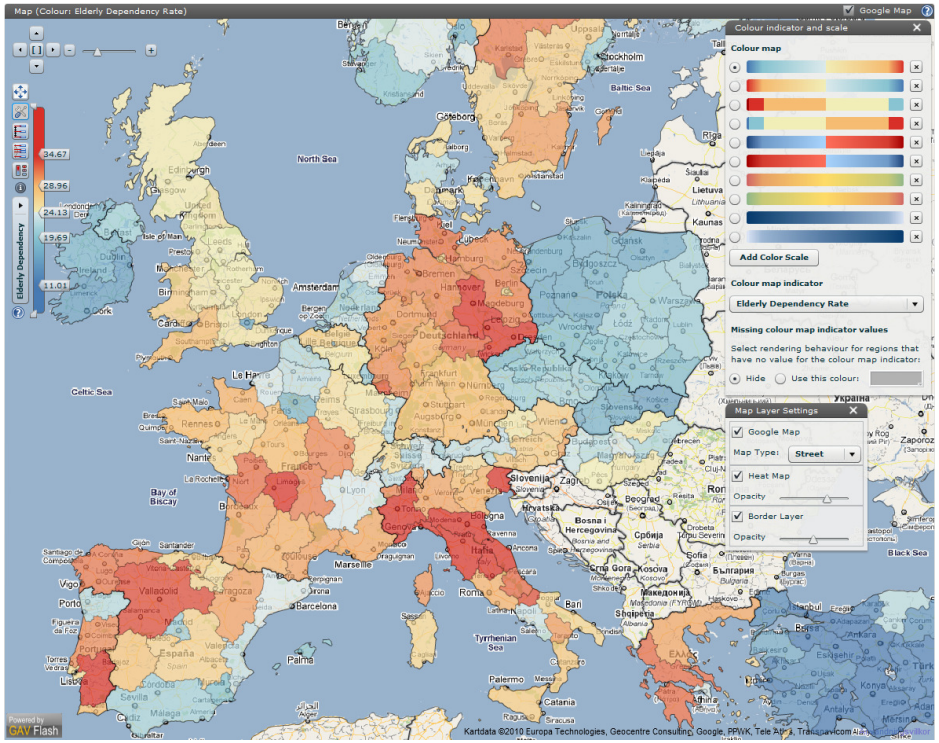
NCVA

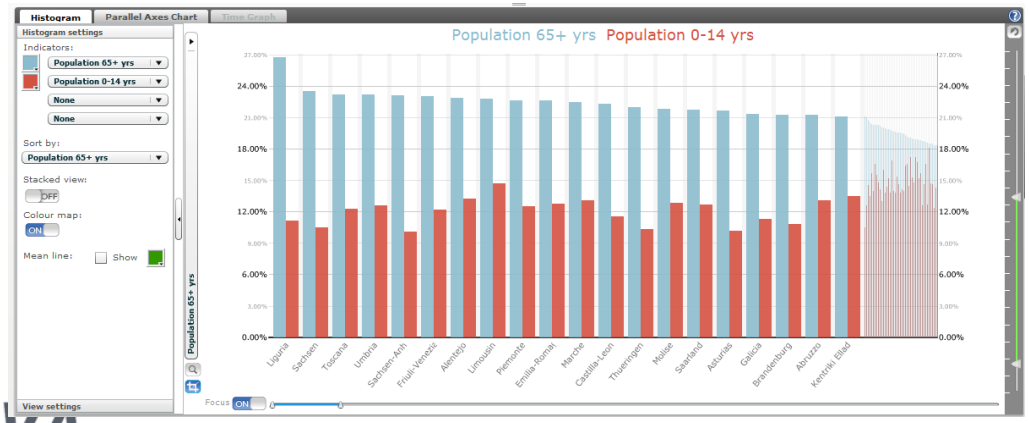
NCVA
National Center for Visual Analytics

Why is Storytelling about Statistics important?

- Tell a story about a region's development over time and shape the measure of economic growth and well-being;
- Discoveries that engagingly draw us into reflections about the knowledge on how life is lived - and can be improved;
- Invite the reader to dynamically participate in this visual statistics discovery process;
- Help advancing research critical to the collaboration and dissemination of official statistics by means of advanced web-enabled tools;

Explore, Collaborate and Publish Official Statistics
Integrate dynamic visualization with Storytelling





Ageing population in Europe 1990-2008

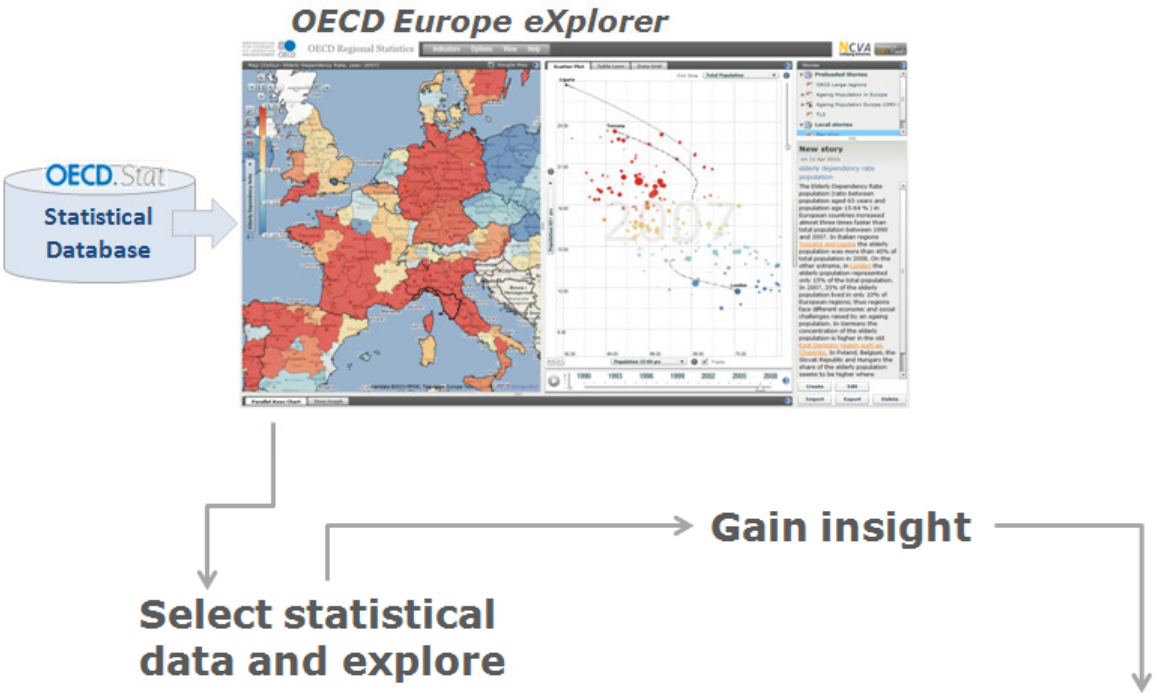
by Mikael Jern, NCVA on 11 Apr 2010

elderly dependency rate population

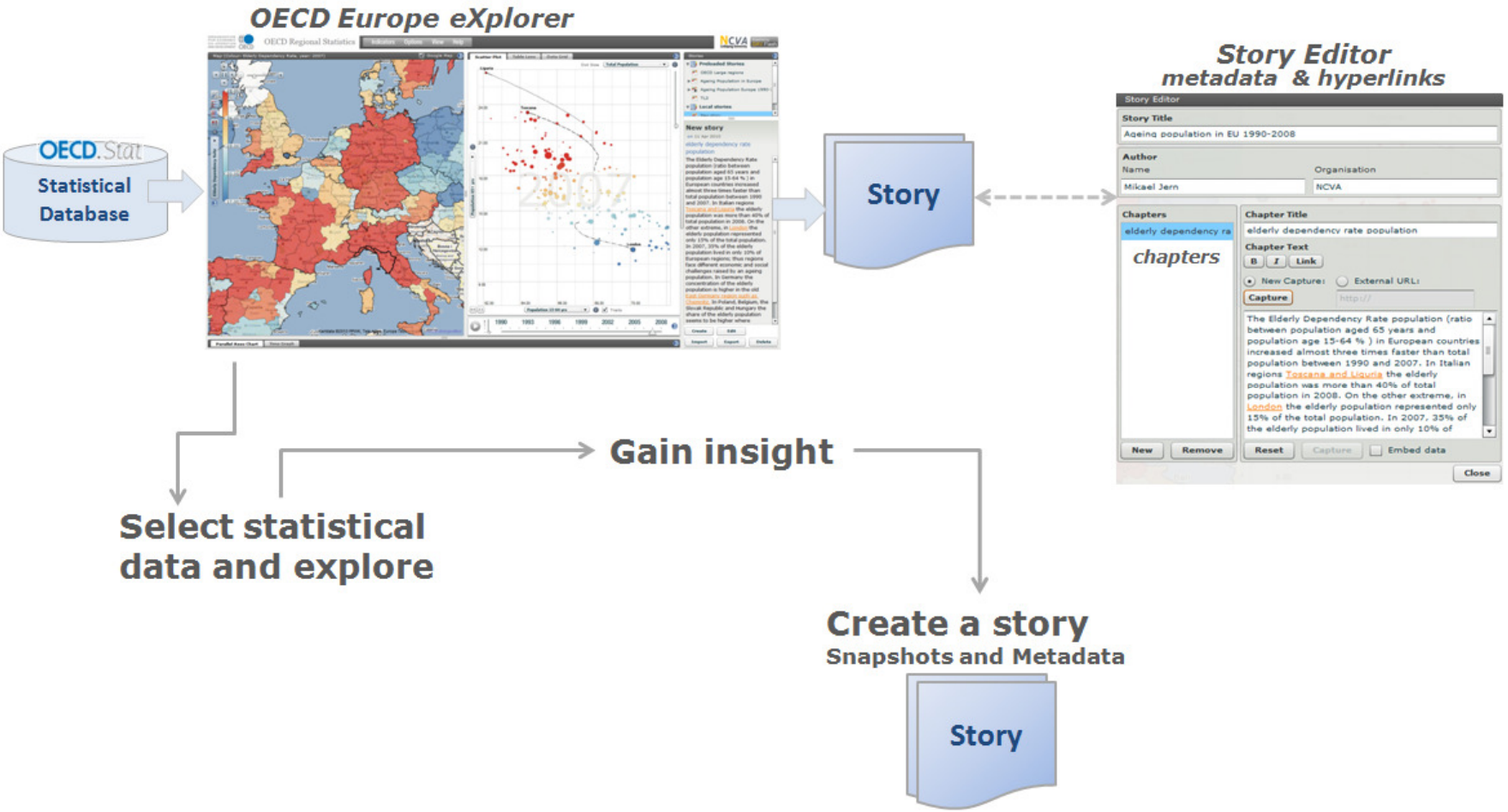
The Elderly Dependency Rate population (ratio between population aged 65 years and population age 15-64 %) in European countries increased almost three times faster than total population between 1990 and 2007. In Italian regions Toscana and Liguria the elderly population was more than 40% of total population in 2008. On the other extreme, in London the elderly population represented only 15% of the total population. In 2007, 35% of the elderly population lived in only 10% of European regions; thus regions face different economic and social challenges raised by an ageing population. In Germany the concentration of the elderly population is higher in the old East Germany region such as Chemnitz. In Poland, Belgium, the Slovak Republic and Hungary the share of the elderly population seems to be higher where population is more concentrated, generally in urban regions.

NCVA

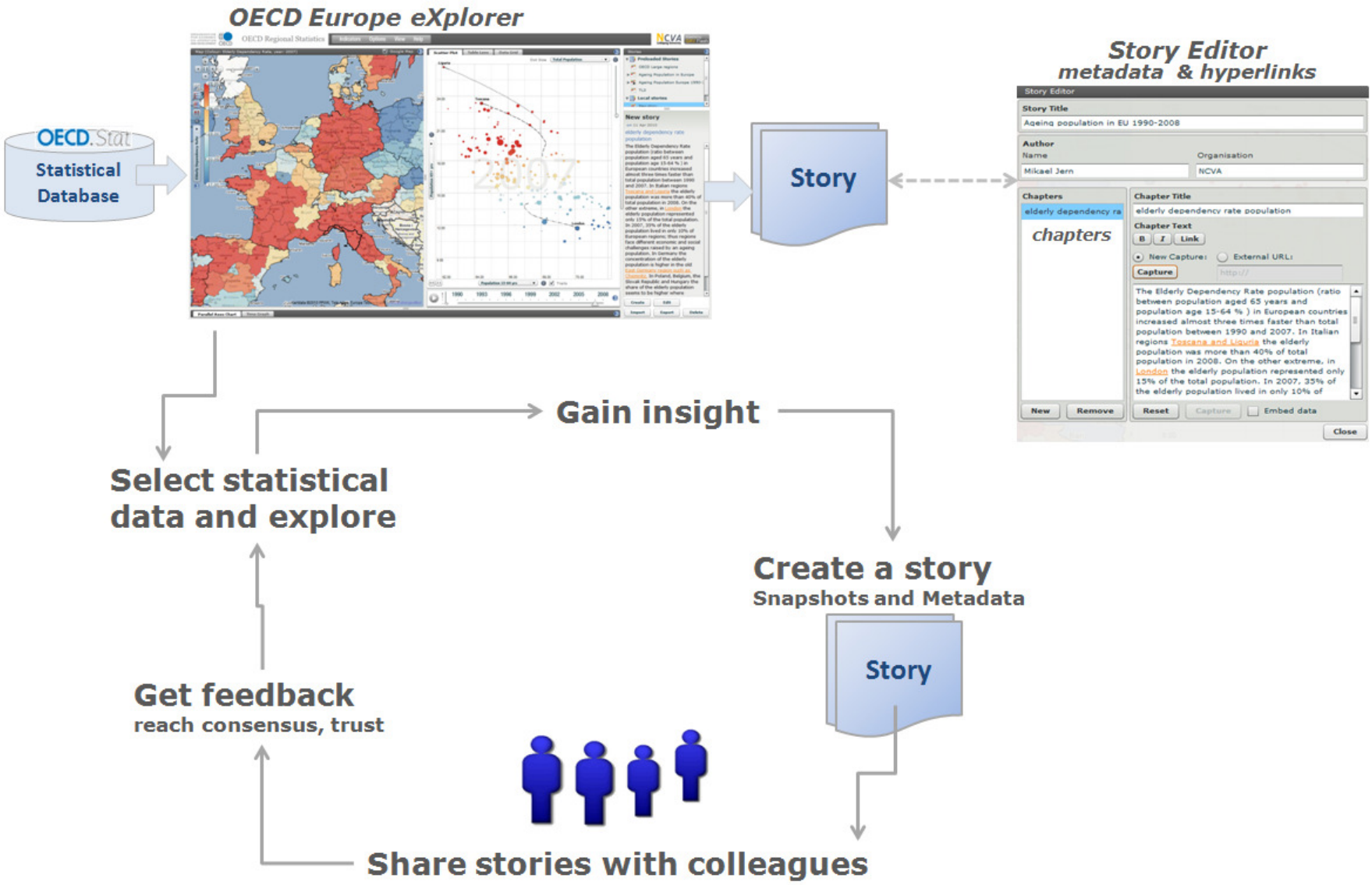
The Storytelling Loop



The Storytelling Loop

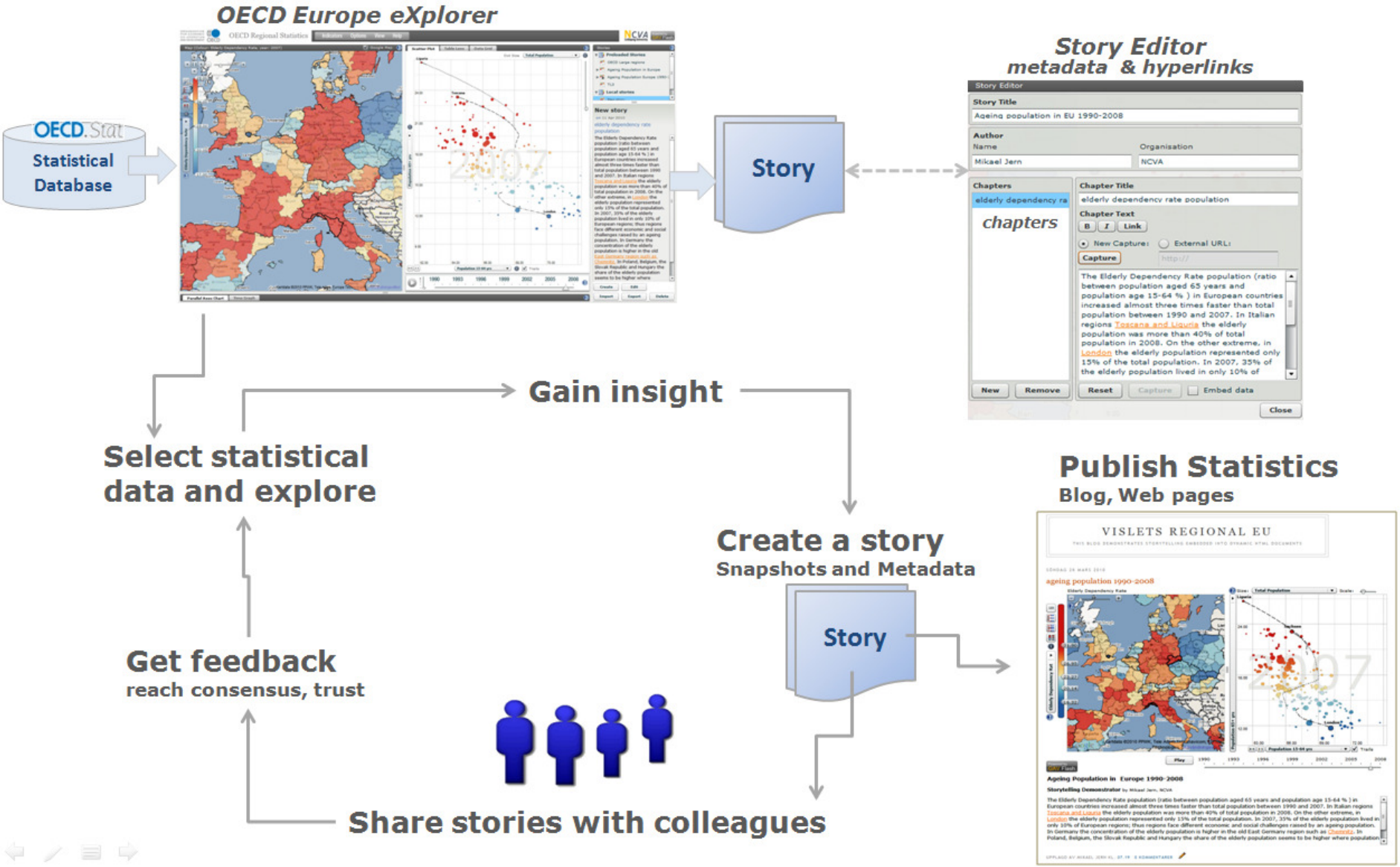


The Storytelling Loop



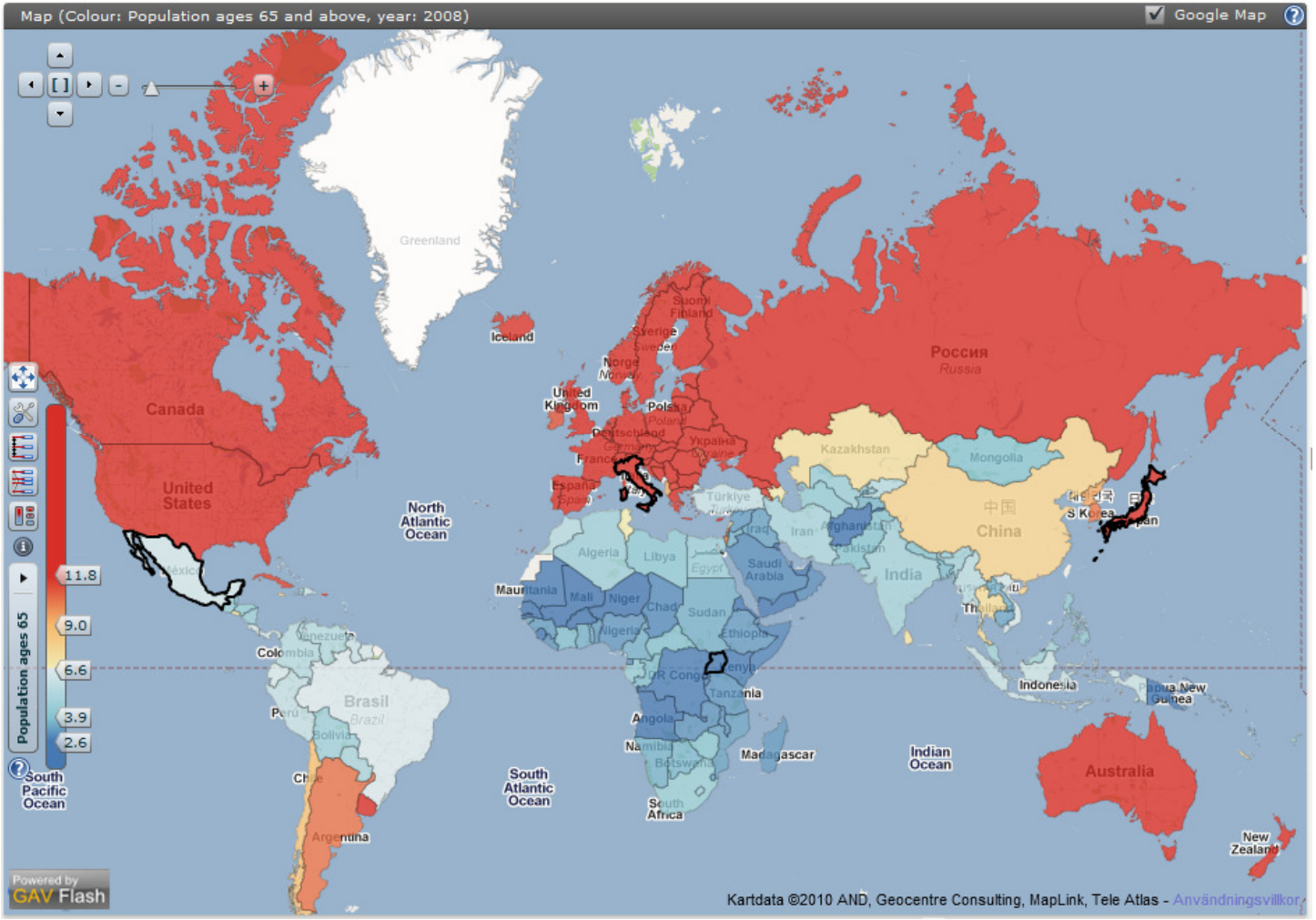
The Storytelling Loop

two levels of collaborations



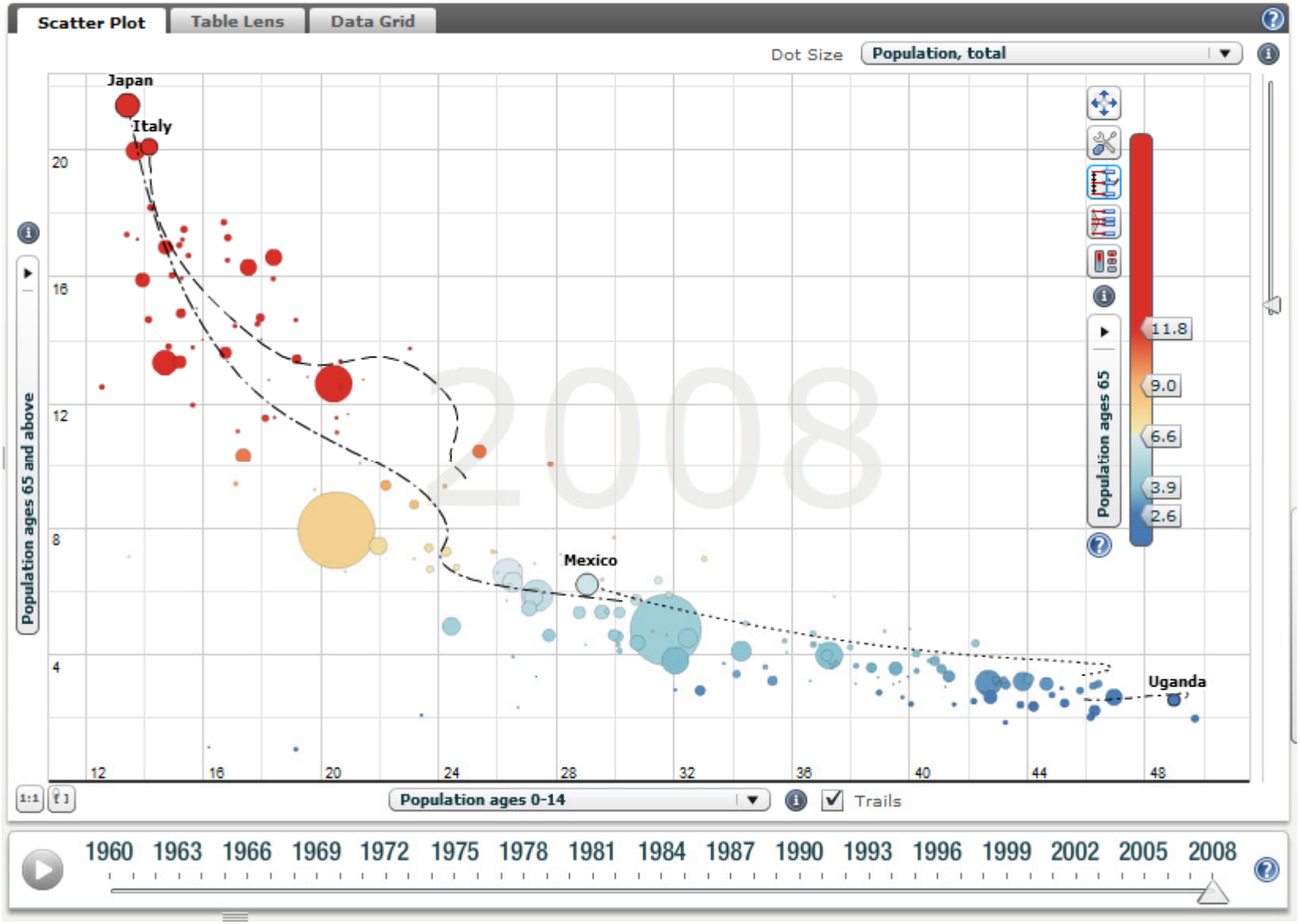
Tell a story about ageing population in the world 1960-2008

Sweden, Germany, Japan and Uganda



NCVA

Tell a story about ageing population in the world 1960-2008

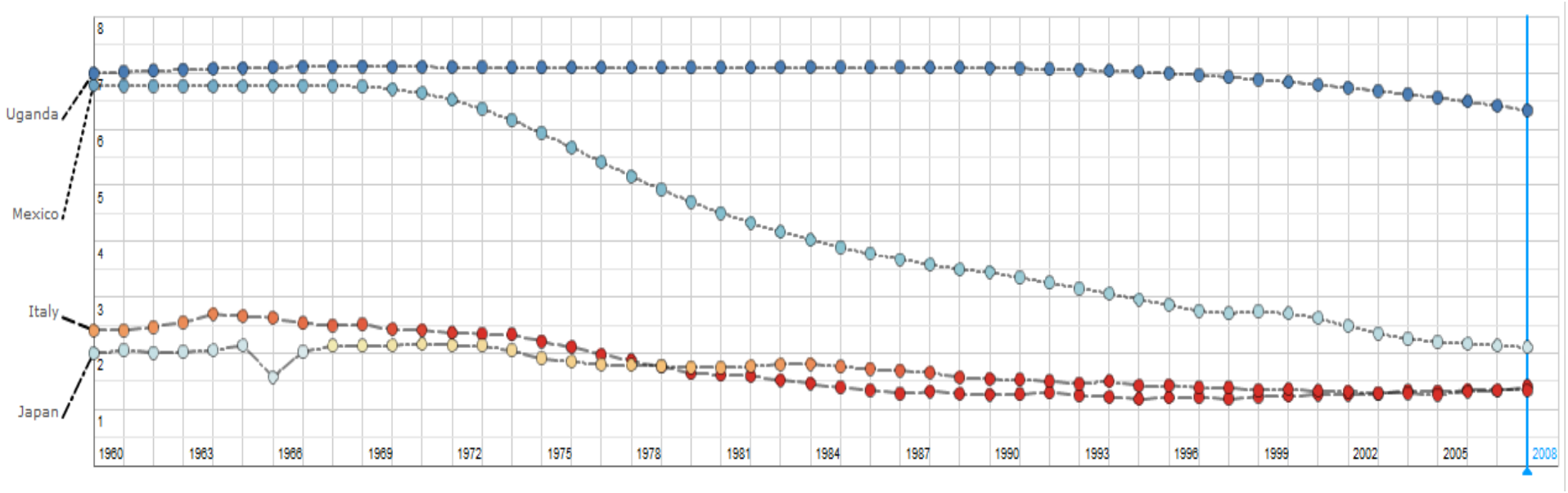


Time

NCVA

Tell a story about ageing population in the world 1960-2008

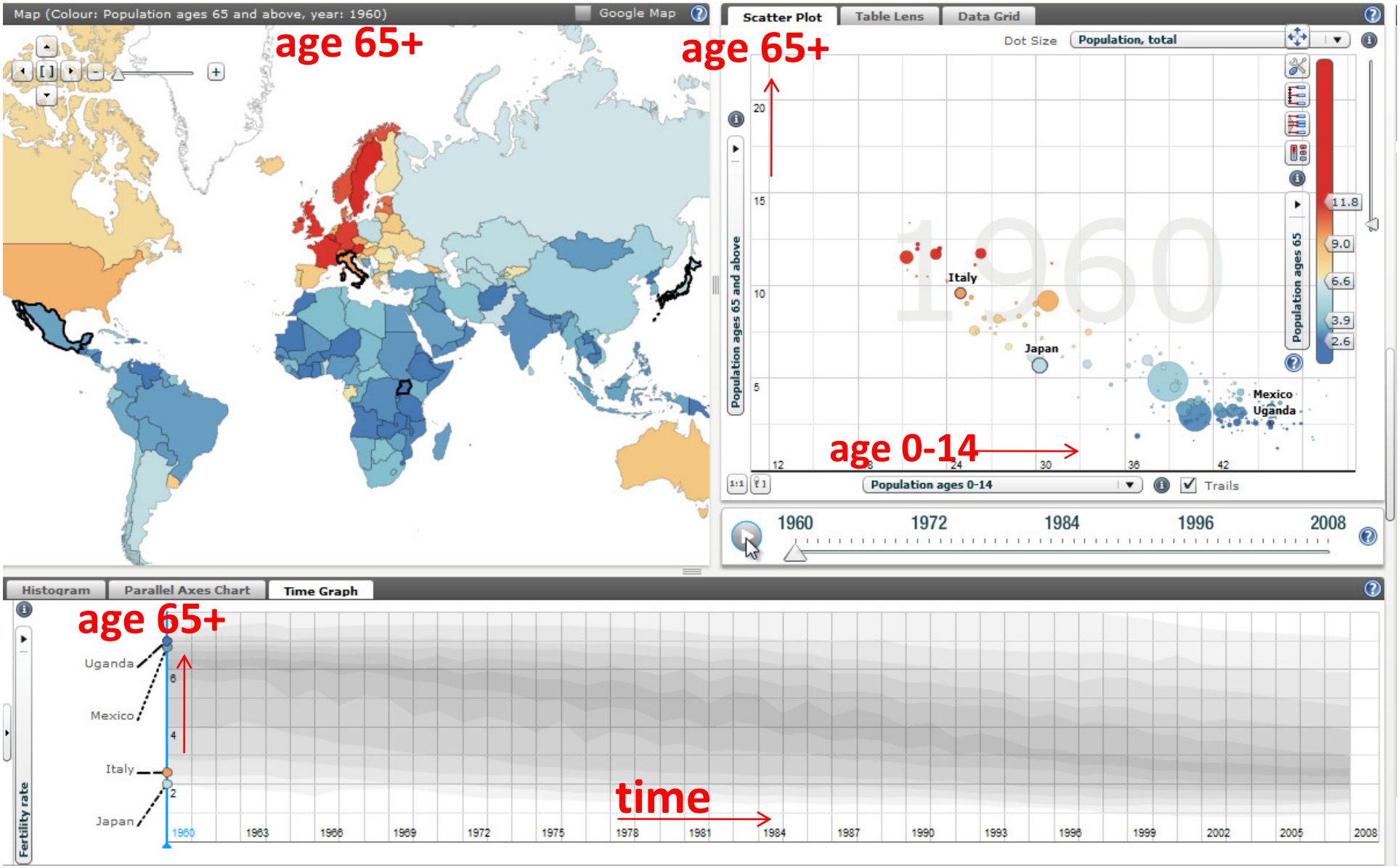
Sweden, Germany, Japan and Uganda



NCVA

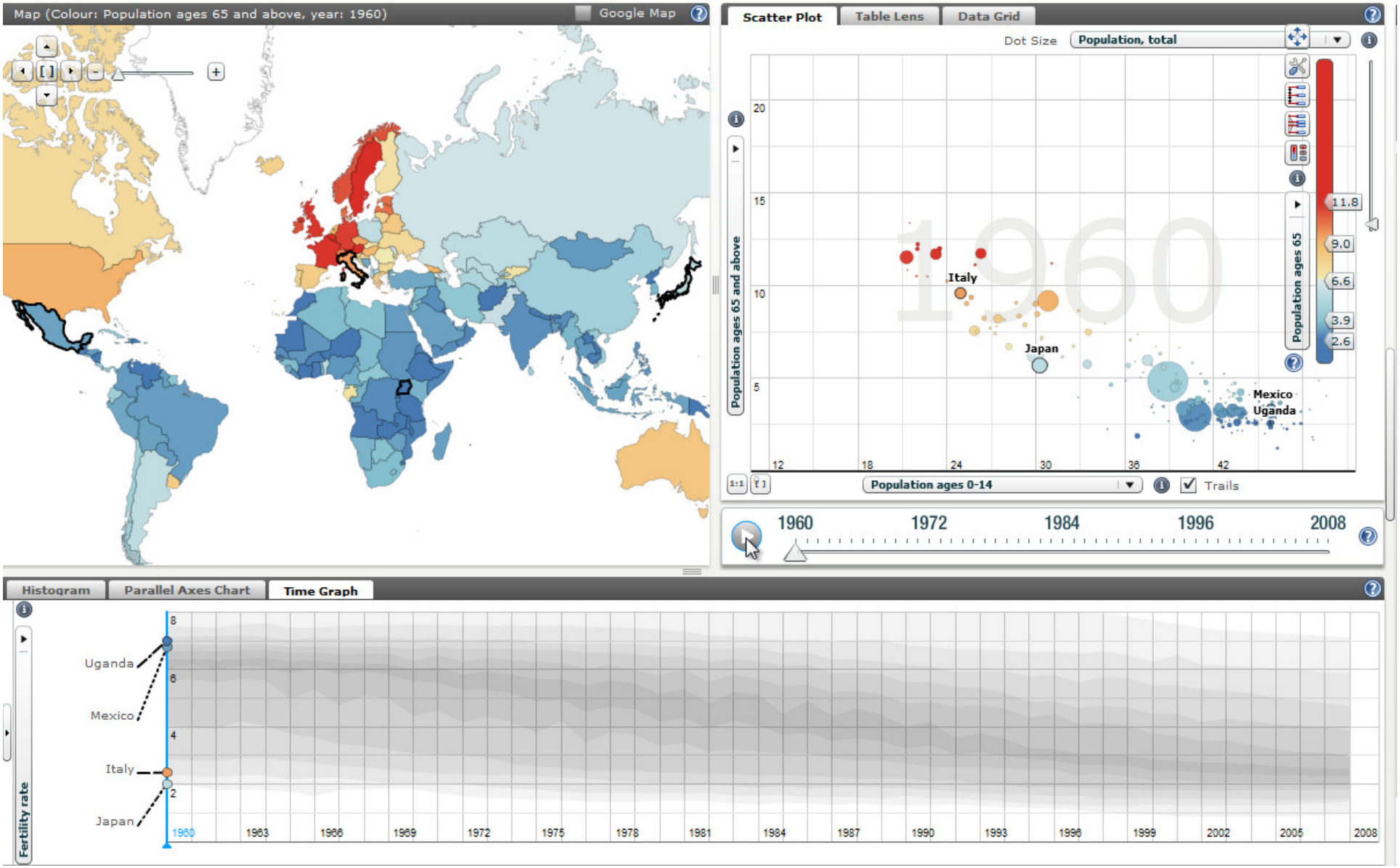
Tell a story about ageing population in the world 1960-2008

Sweden, Germany, Japan and Uganda



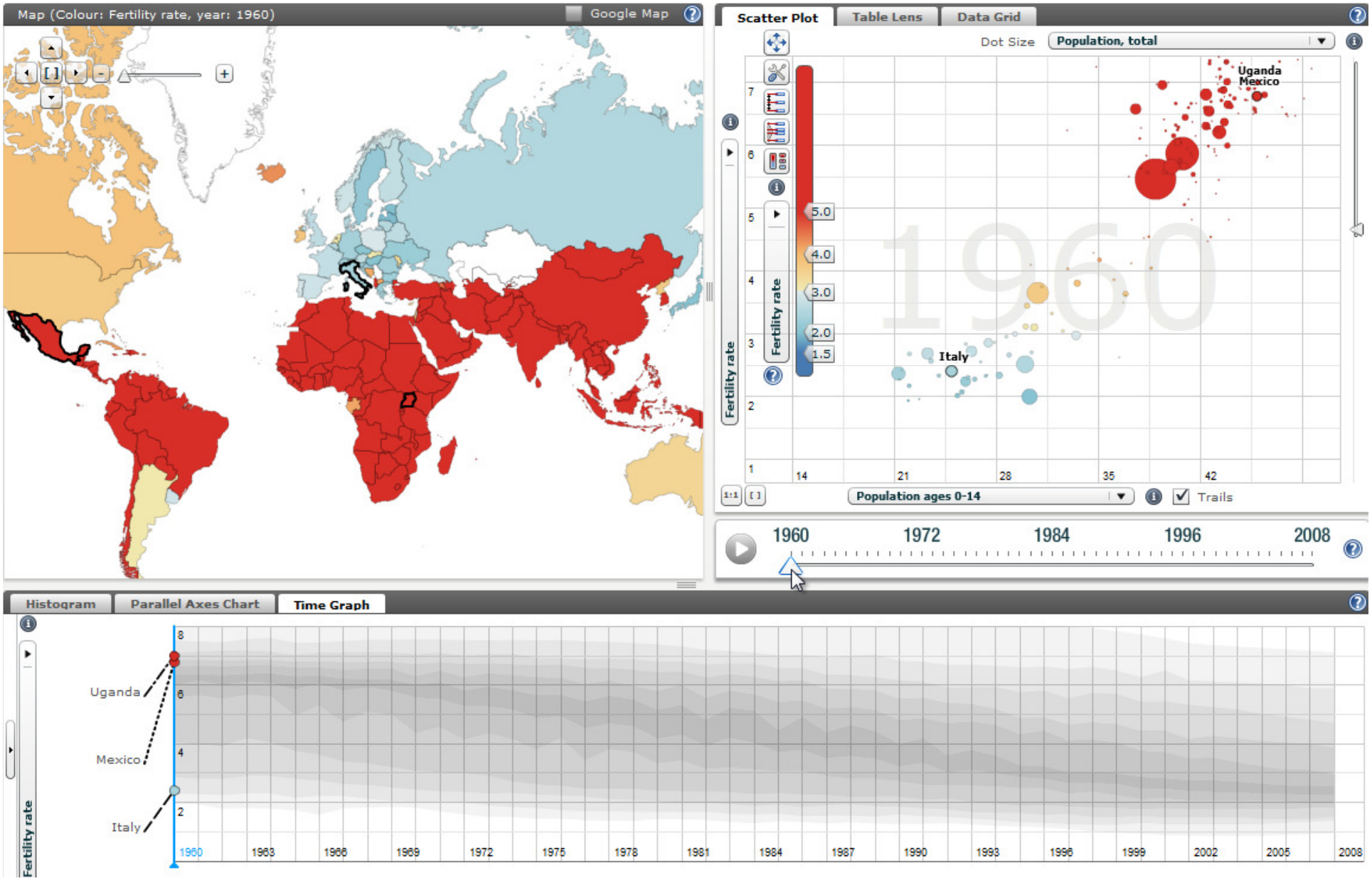
Tell a story about ageing population in the world 1960-2008

Sweden, Germany, Japan and Uganda



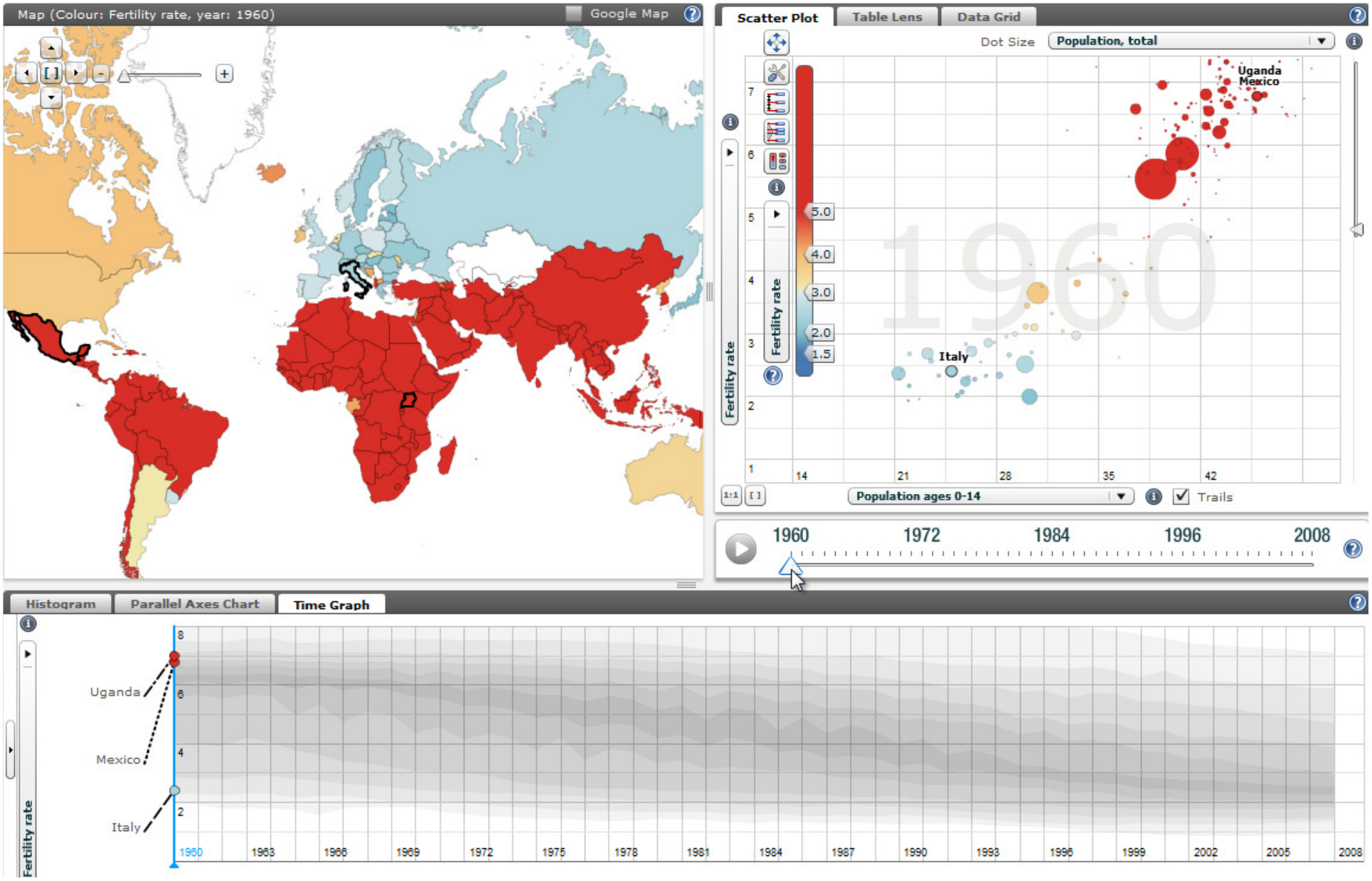
A story about fertility rate during 1960-2008

Uganda, Mexico and Italy



A story about fertility rate during 1960-2008

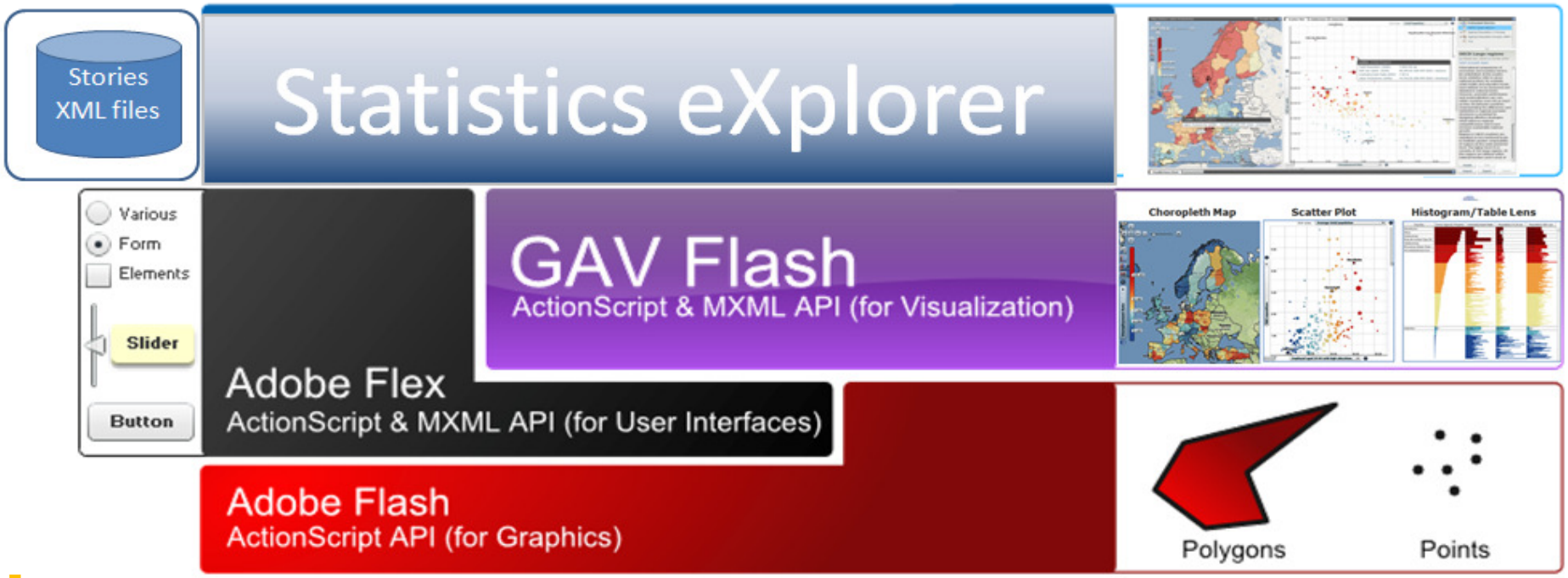
Uganda, Mexico and Italy



Statistics eXplorer is based on Adobe Flash

Requirement by the statistics community

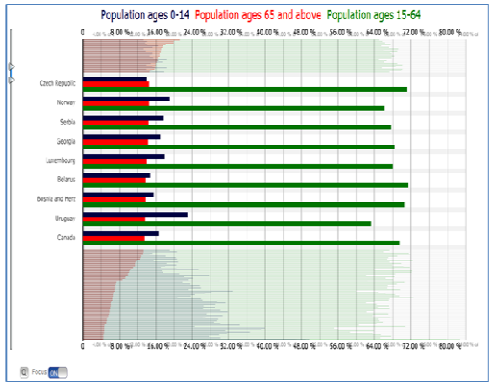
- **Web 2.0** compliant **explorative**, **communicative** and **collaborative** dynamic statistical visualization;
- **V**isualization tools are developed and optimized for the Adobe© ActionScript for Flash 10 and Flex 3 platform;
- Explore **large spatio-temporal** and **multidimensional** statistics data;
- Publish statistics knowledge and insight through **Storytelling**;

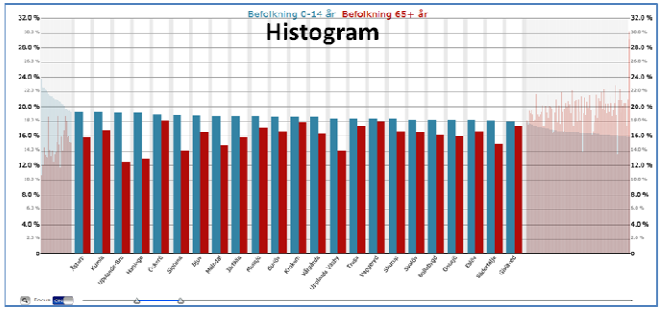


NCVA

Time-linked views for multidimensional statistics data
See data simultaneously in different views

Histogram





Scatter Plot

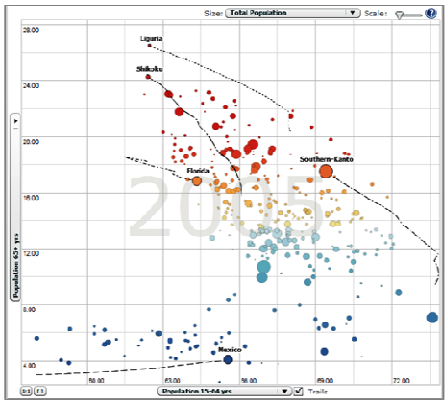
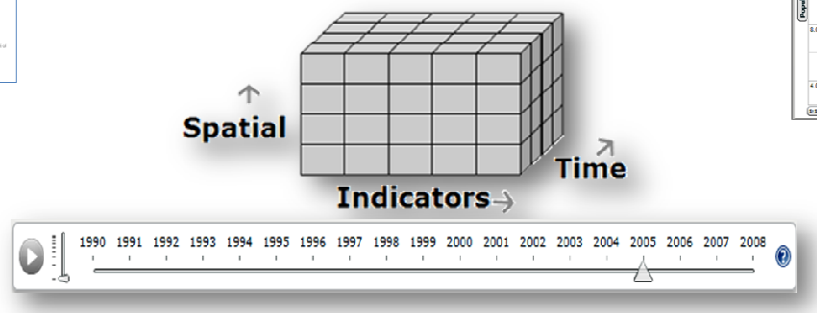
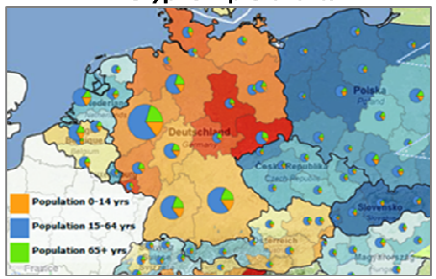


Table Grid

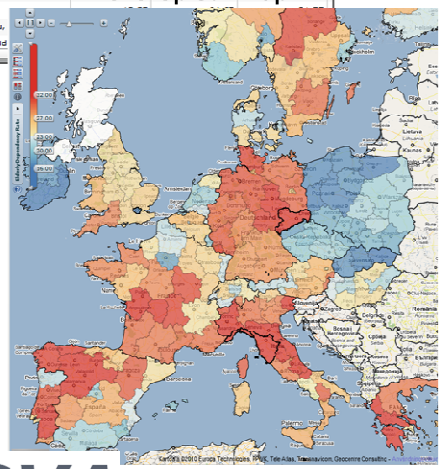
Name	Population 0-14	Population 15-64	Population 65+
Liguria	11.02	62.48	26.51
Shikoku	13.31	62.41	24.28
Umbria	12.43	64.30	23.26
Toscana	12.04	64.81	23.15
Tohoku	13.74	63.21	23.05
Chugoku	13.78	63.17	23.05
Limousin	14.70	62.26	23.03
Hokuriku	13.72	63.31	22.98
Alentejo	13.43	63.69	22.88
Emilia-Romagna	12.33	64.96	22.72
Castilla y Leon	11.63	65.81	22.56
Marche	13.84	64.57	22.39
Friuli-Venezia Giulia	11.92	65.86	22.22
Piemonte	12.42	65.46	22.12
Principado de Asturias	[illegible]	[illegible]	21.82
Molise	[illegible]	[illegible]	[illegible]
Kyushu,	[illegible]	[illegible]	[illegible]
Hokkaido	[illegible]	[illegible]	[illegible]

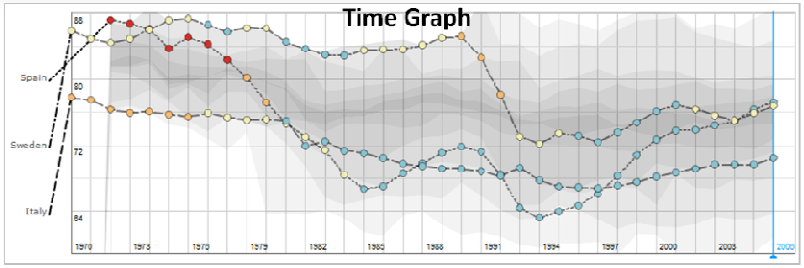


Glyphs – pie charts



Choropleth Map





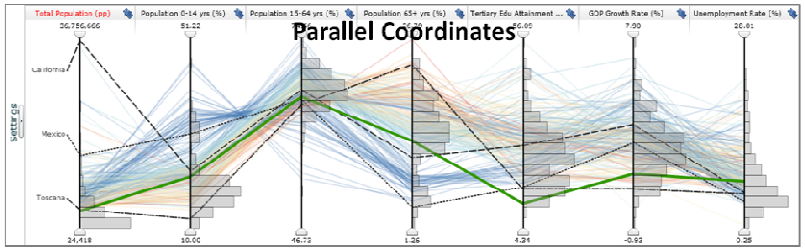
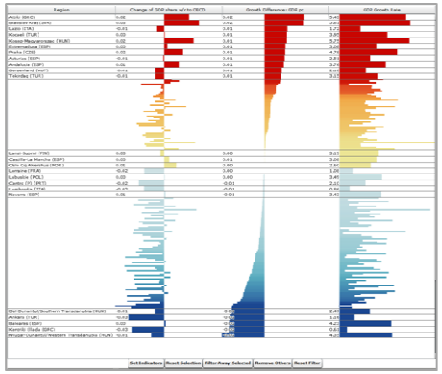


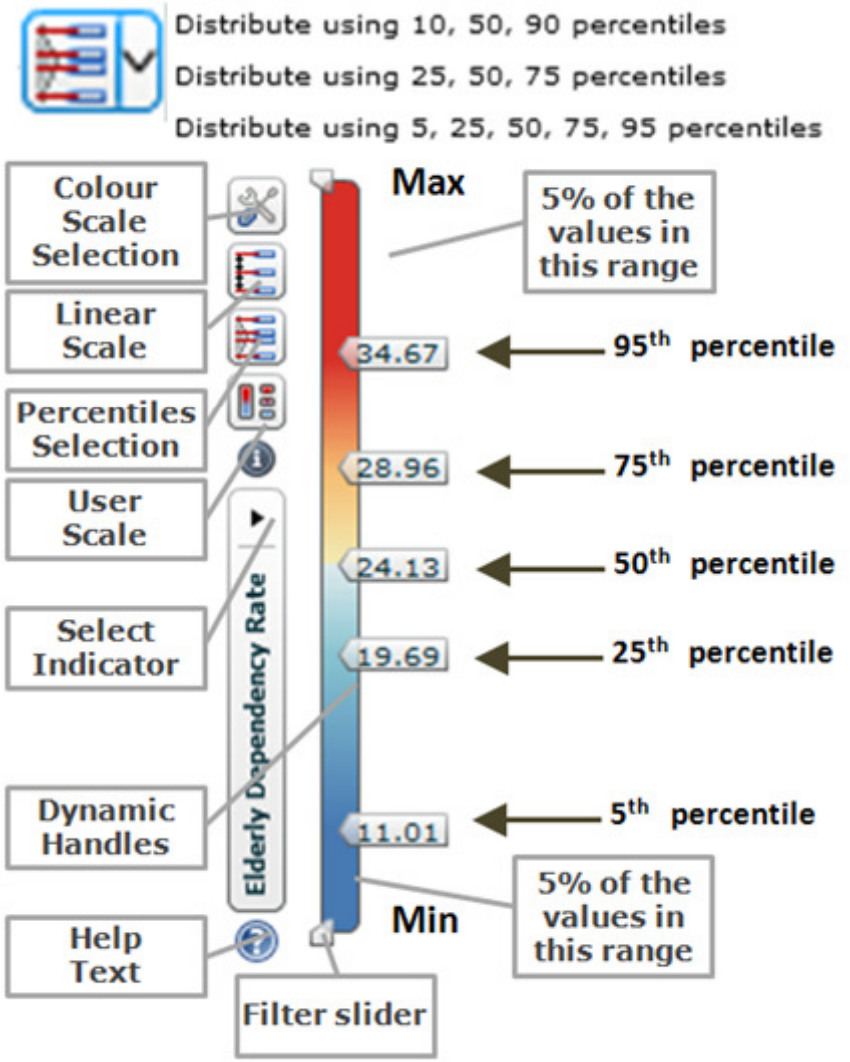
Table lens



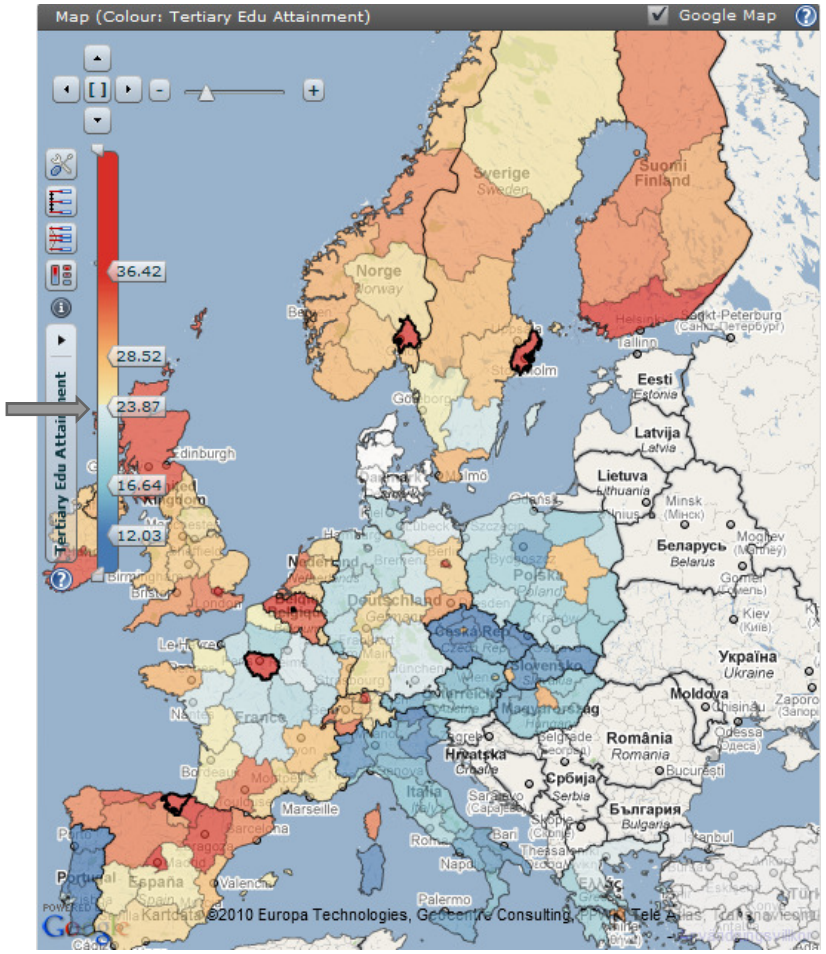
NCVA

Dynamic Colour Legend

facilitating statistical methods for class value calculations and scientifically tested **perceptual acceptance of colour scales** and a **filter mechanism** attached to legend;

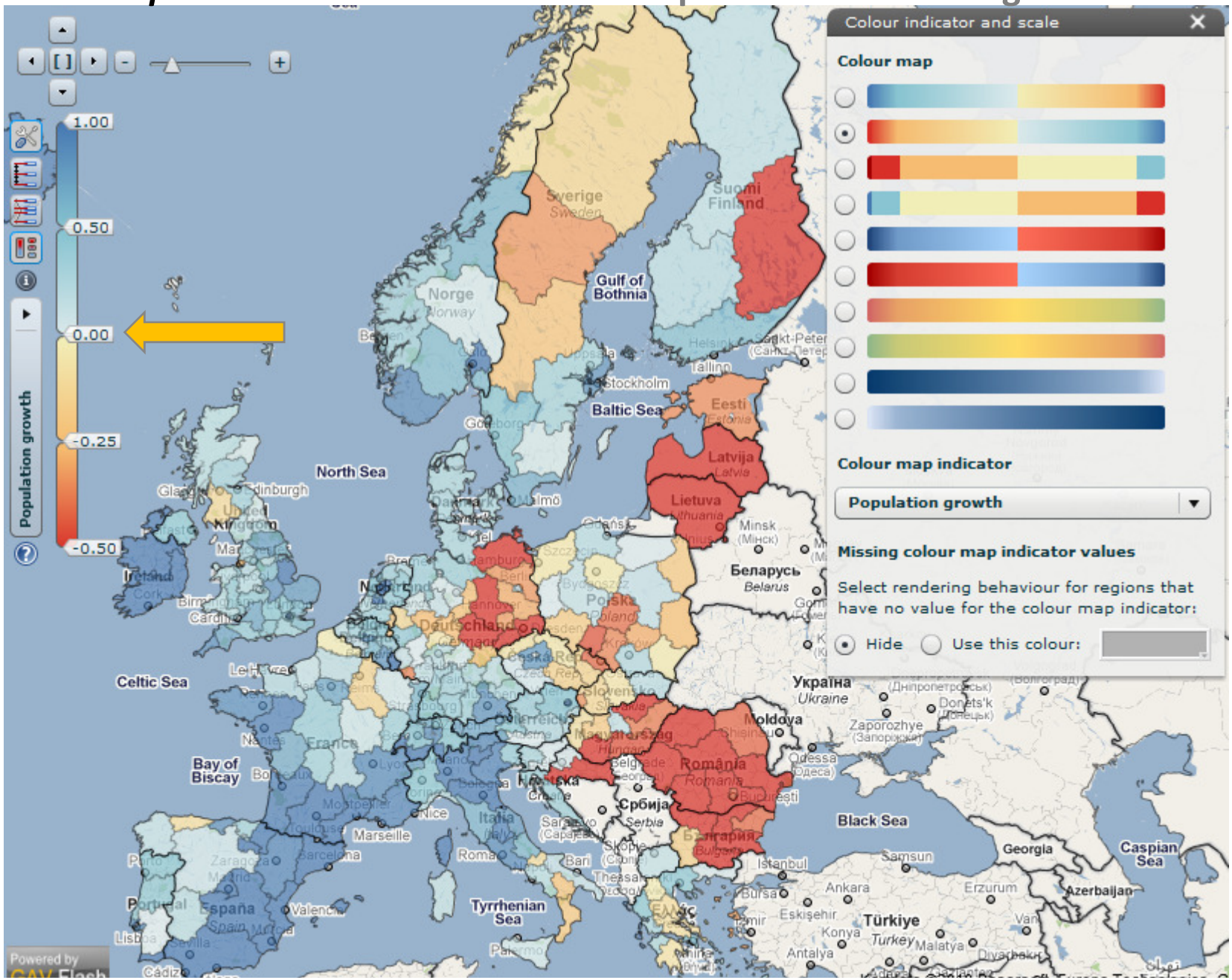


High level education



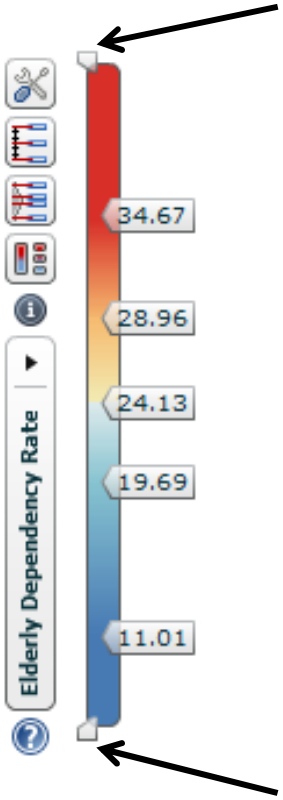
Divergent Colour Scale

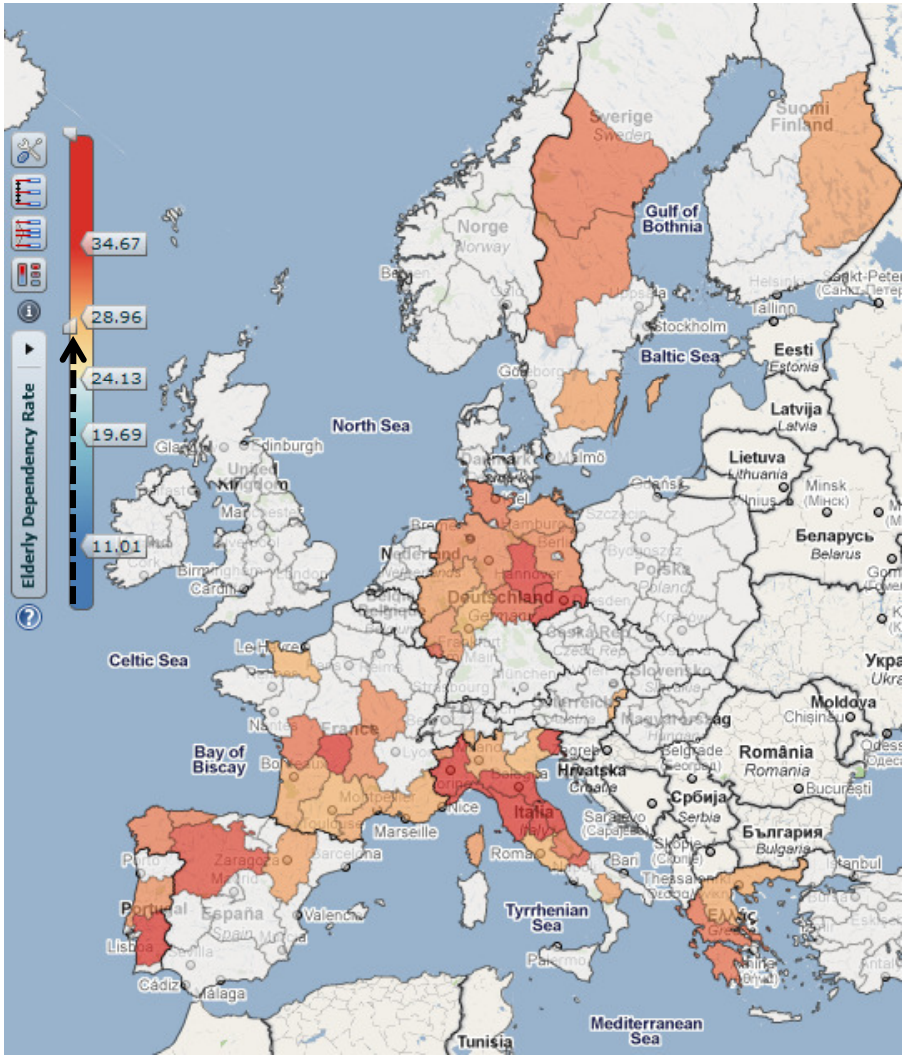
"Population Growth Rate" - **Blue** is positive and **Red** negative



Dynamic Filter Mechanism attached to Legend

regions with ***elderly dependency above 90th percentile***



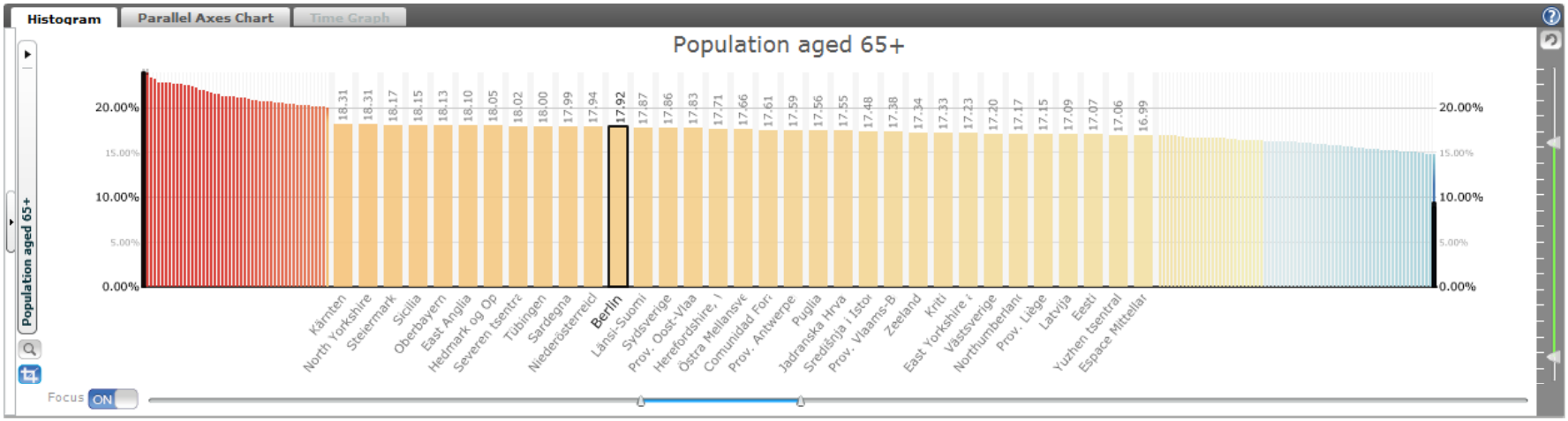


NCVA

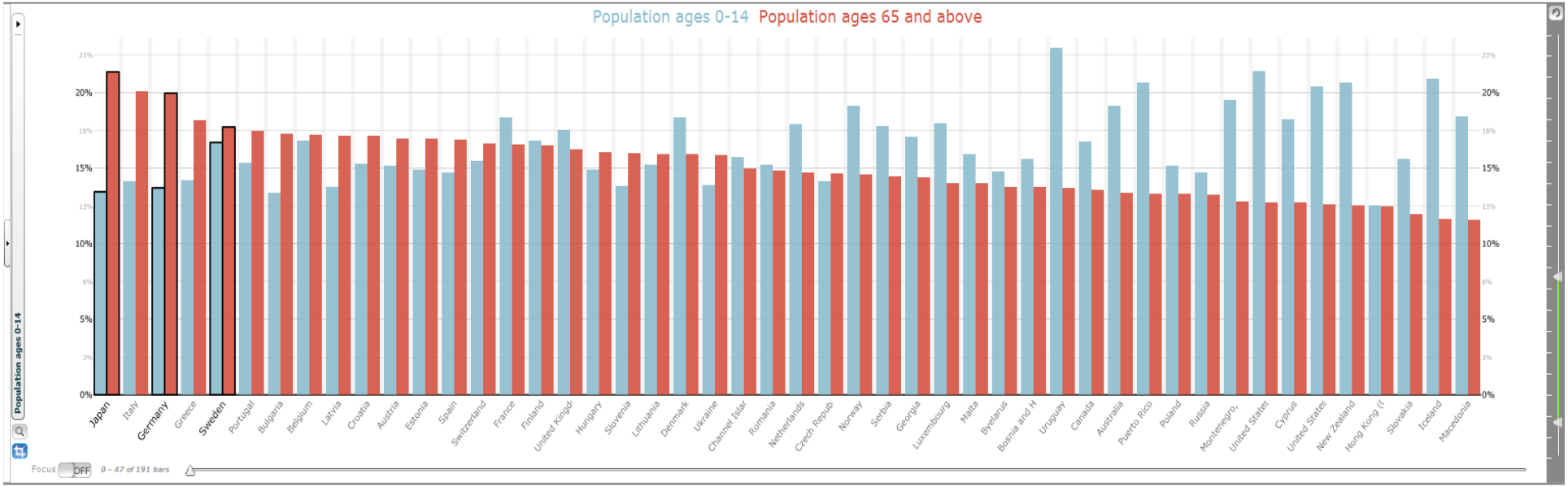
Introduce InfoVis technique to the statistics community

dynamic histogram based on Focus & Context technique

Population aged 65+ OECD TL2 regions

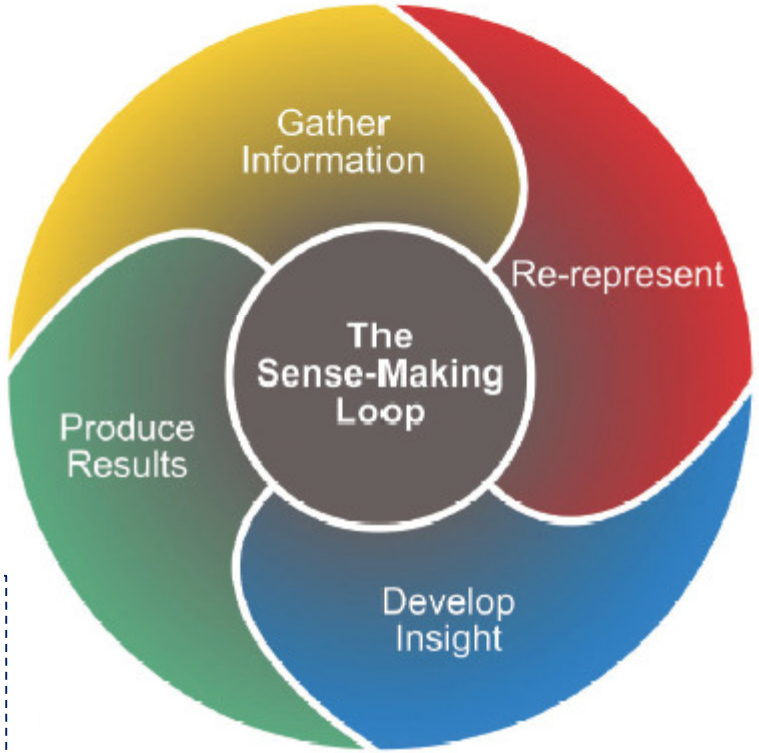


Population aged 65+ countries



Geovisual Analytics Reasoning Process

- **Gather information and data**
  Tasks to be answered?
- **Visual representation**
  Choose visual forms that aid analysis;
- **Develop insight**
  Through exploration and dynamic visual inquiries;
- **Share insight and knowledge**
  Collaboration , Storytelling and Publishing;



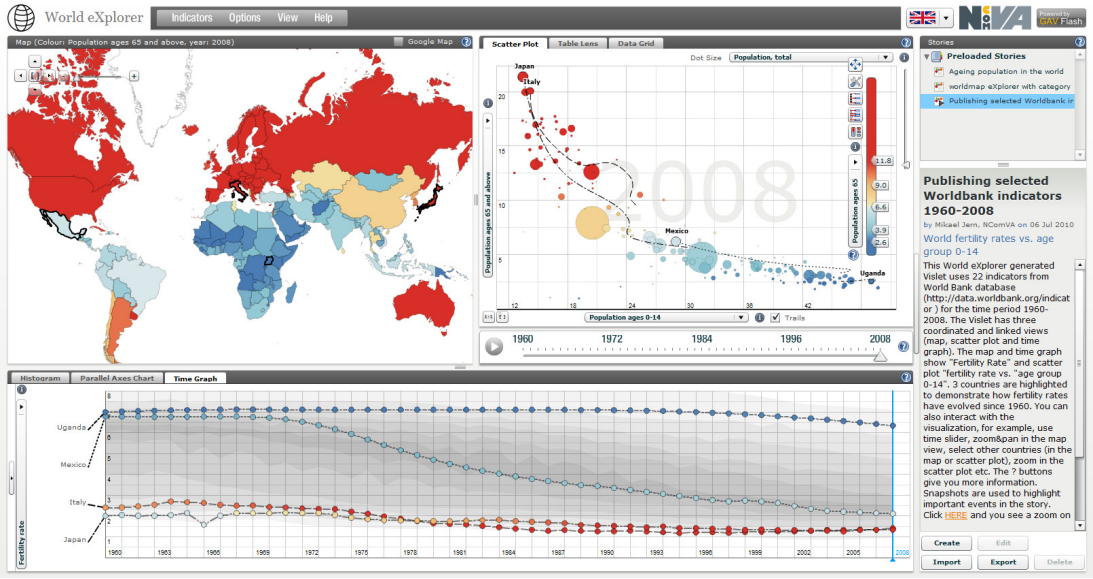
Collaborative Statistics Visualization for the Web

tools to first analyse, collaborate and publish insights and knowledge

Statistics eXplorer - author tool

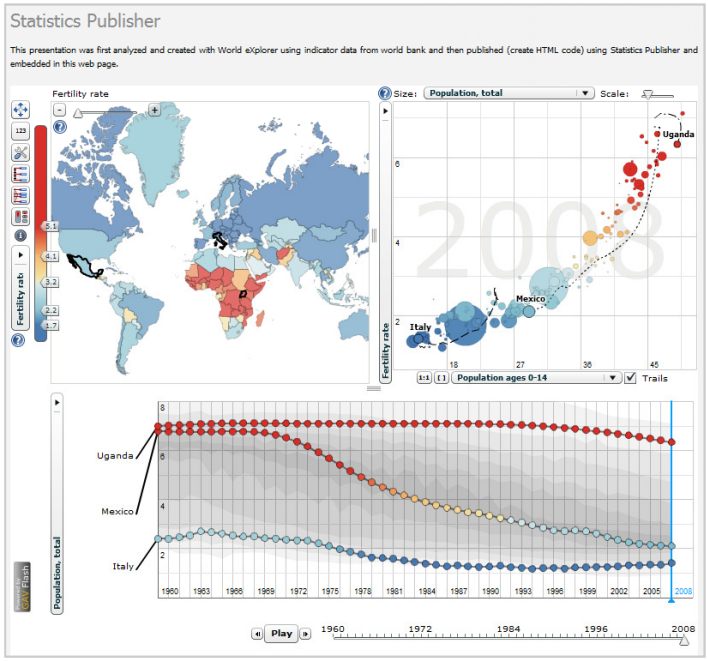
Analyse - Gain insight – Storytelling

Collaborate



Statistics Publisher

Publish – Insight - Knowledge



NCVA

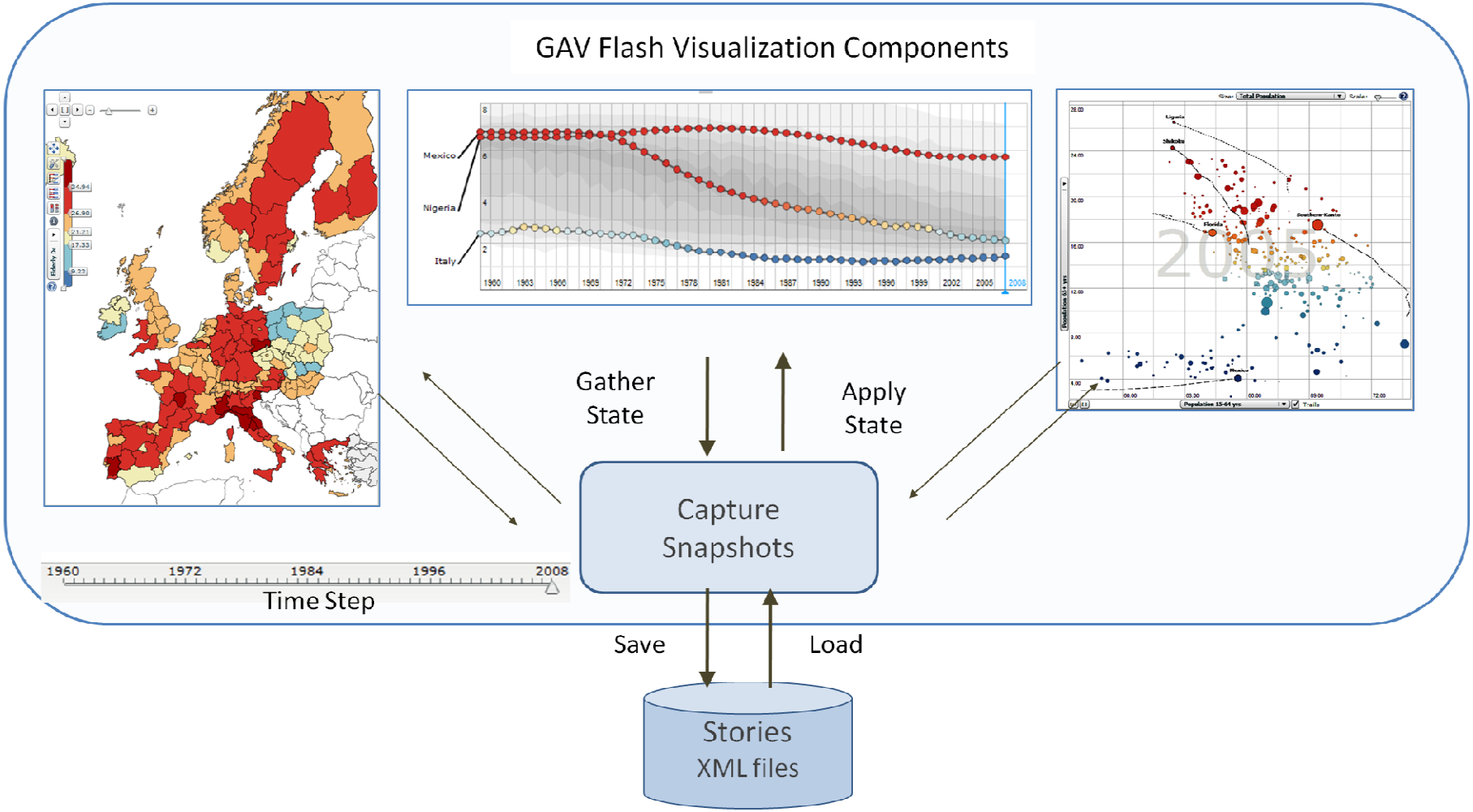
NCVA

Publishing statistics information requires Storytelling

- GAV Flash (eXplorer) has an architecture supporting Storytelling;
- Capture the current application state for all views;
- Dataset, map positions, scatter plot axes, time step – everything is saved as a “snapshot”;
- Stories with metadata are saved as XML files
- and can then be shared with colleagues;

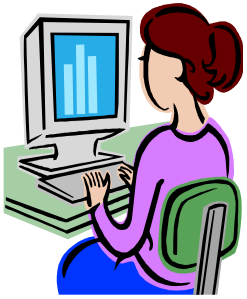
Storytelling requires a Snapshot Mechanism to capture important events

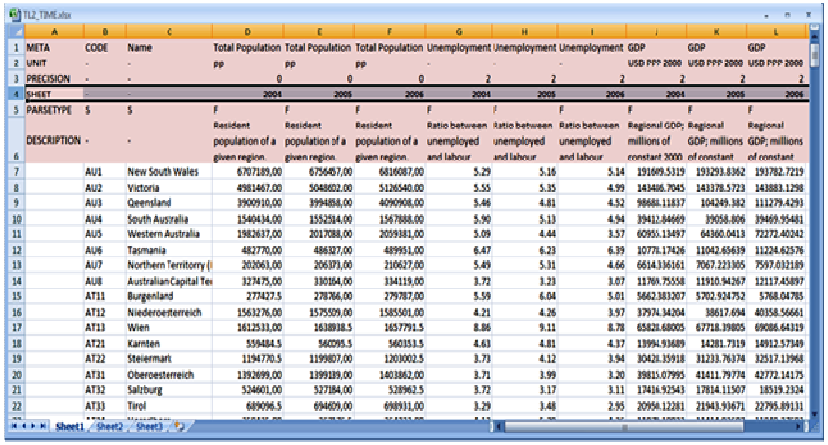
time, region (s), methods, indicator, colour, ..



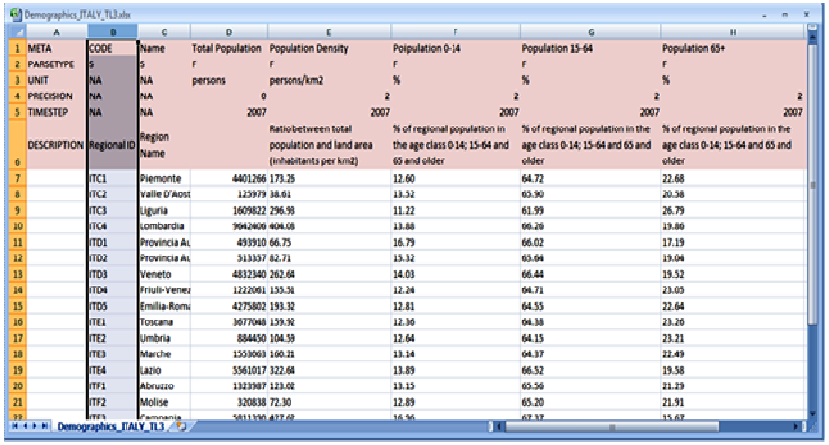
Step 1 Statistics eXplorer – analytic and authoring tool

Select regions and indicators to be analysed – here OECD regional Statistics

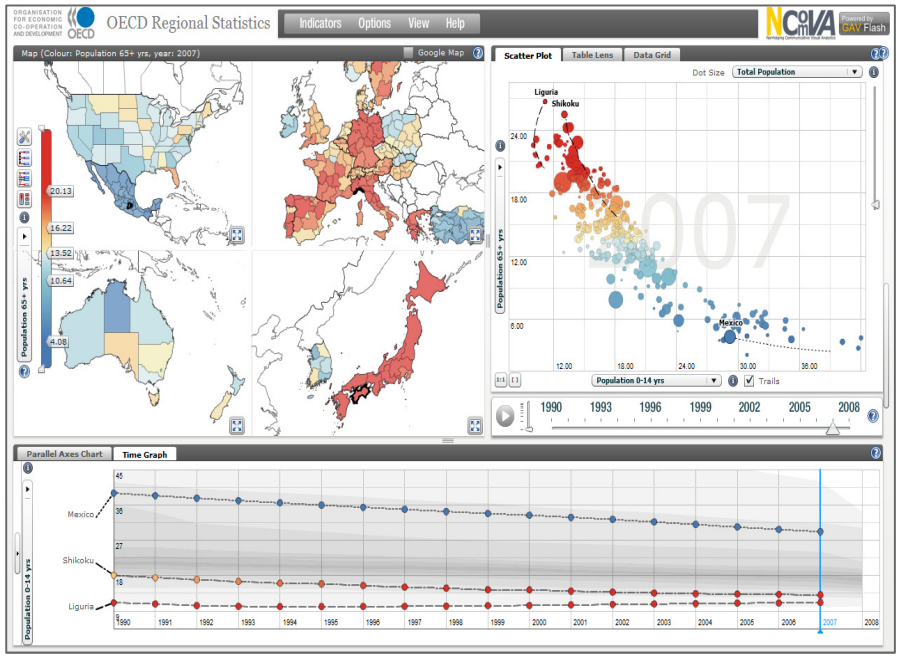




META	CODE	Name	Total Population	Total Population	Total Population	Unemployment	Unemployment	Unemployment	GDP	GDP	GDP
UNIT	-	-	PP	PP	PP	-	-	-	USD PPP 2000	USD PPP 2000	USD PPP 2000
PRECISION	-	-	0	0	0	2	2	2	2	2	2
SHEET	-	-	2004	2005	2006	2004	2005	2006	2004	2005	2006
PARSETYPE	S	S	F	F	F	F	F	F	F	F	F
DESCRIPTION	-	-	Resident population of a given region	Resident population of a given region	Resident population of a given region	Ratio between unemployed and labour	Ratio between unemployed and labour	Ratio between unemployed and labour	Regional GDP; millions of constant 2000	Regional GDP; millions of constant	Regional GDP; millions of constant
	AU1	New South Wales	6707189,00	6756457,00	6816087,00	5.29	5.16	5.14	191699.5319	193293.6362	193782.7219
	AU2	Victoria	4981467.00	5048602.00	5126540.00	5.55	5.35	4.99	143406.7045	143378.5723	143883.1298
	AU3	Queensland	3900910,00	3994858.00	4090908,00	5.46	4.81	4.52	98688.11837	104249.382	111279.4293
	AU4	South Australia	1540434,00	1552514,00	1567868,00	5.90	5.13	4.94	39412.84669	39058.806	39469.95481
	AU5	Western Australia	1982637,00	2017088,00	2059381,00	5.09	4.44	3.57	60955.13497	64360.0413	72272.40242
	AU6	Tasmania	482770,00	486327,00	489951,00	6.47	6.23	6.39	10778.17426	11042.65619	11224.62576
	AU7	Northern Territory (I	202063,00	206373,00	210627,00	5.49	5.31	4.66	6614.334161	7067.221305	7597.032189
	AU8	Australian Capital Te	323475,00	330164,00	334119,00	3.72	3.23	3.07	11769.75558	11910.94267	12117.45897
	AT11	Burgenland	277427.5	278766,00	279787,00	5.59	6.04	5.01	5662.383267	5702.924752	5768.04785
	AT12	Niederoesterreich	1561276,00	1575509,00	1585501,00	4.21	4.26	3.97	37974.34264	38617.694	40358.56661
	AT13	Wien	1612513,00	1638938.5	1657791.5	8.86	9.11	8.78	65820.68065	67718.39805	69086.64319
	AT21	Kaernten	559484.5	560295.5	560353.5	4.63	4.81	4.37	13994.93689	14281.7319	14912.57349
	AT22	Steiermark	1194770.5	1199807,00	1203002.5	3.73	4.12	3.94	30428.35918	31233.76374	32517.13968
	AT31	Oberoesterreich	1392699,00	1399189,00	1403862,00	3.71	3.99	3.20	39815.67995	41411.79774	42772.14175
	AT32	Salzburg	524601,00	527184,00	528962.5	3.72	3.17	3.11	17416.92543	17814.11507	18519.2324
	AT33	Tirol	689096.5	694609,00	698911,00	3.29	3.48	2.95	20956.12281	21943.93671	22795.89111



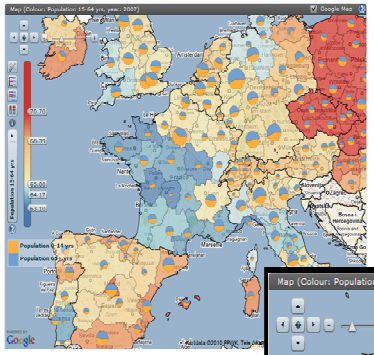
META	CODE	Name	Total Population	Population Density	Population 0-14	Population 15-64	Population 65+
PARSETYPE	S	S	F	F	F	F	F
UNIT	NA	NA	persons	persons/km2	%	%	%
PRECISION	NA	NA	0	2	2	2	2
TIMESTEP	NA	NA	2007	2007	2007	2007	2007
DESCRIPTION	RegionalID	Region Name		Ratio between total population and land area (inhabitants per km2)	% of regional population in the age class 0-14; 15-64 and 65 and older	% of regional population in the age class 0-14; 15-64 and 65 and older	% of regional population in the age class 0-14; 15-64 and 65 and older
	ITC1	Piemonte	4401266	179.25	12.60	64.72	22.68
	ITC2	Valle D'Aost	123979	38.61	13.52	65.90	20.58
	ITC3	Liguria	1609822	296.93	11.22	61.99	26.79
	ITC4	Lombardia	9642409	404.08	13.88	66.28	19.80
	ITD1	Provincia Au	493910	66.75	16.79	66.02	17.19
	ITD2	Provincia Au	513337	82.71	13.32	65.64	19.04
	ITD3	Veneto	4832540	262.68	14.03	66.44	19.52
	ITD4	Friuli-Venez	1222061	159.56	12.24	64.71	23.05
	ITD5	Emilia-Roma	4275802	193.32	12.81	64.55	22.64
	ITE1	Toscana	3677048	159.92	12.36	64.38	23.26
	ITE2	Umbria	884450	104.59	12.64	64.15	23.21
	ITE3	Marche	1559068	169.28	13.14	64.37	22.49
	ITE4	Lazio	5561017	322.68	13.89	66.52	19.58
	ITF1	Abruzzo	1323987	129.02	13.15	65.56	21.29
	ITF2	Molise	320838	72.30	12.89	65.20	21.91



Step 2 Statistics eXplorer – analytic and authoring tool

Analyse data and gain insight and knowledge - select methods OECD EU Regional Statistics

Glyphs – pie charts



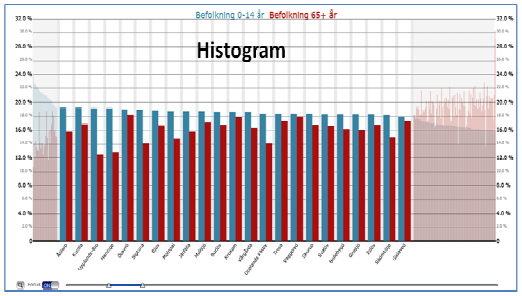


Table lens

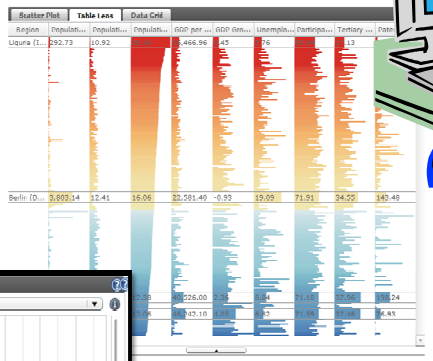
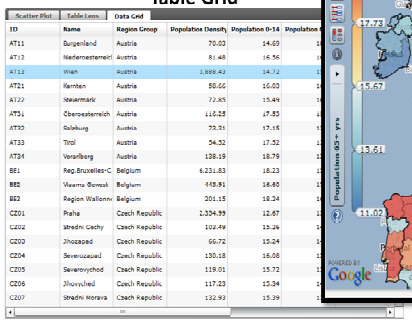
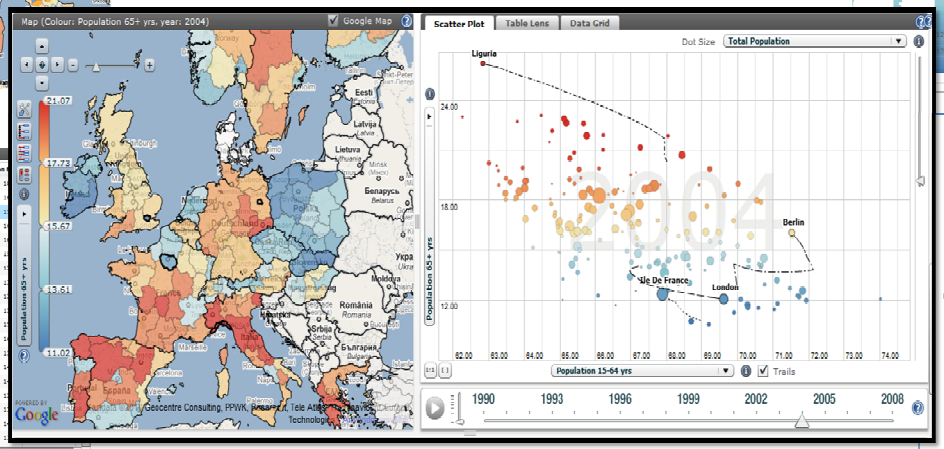
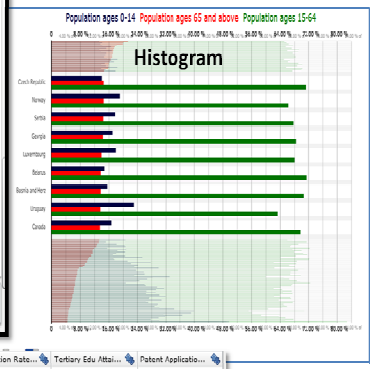


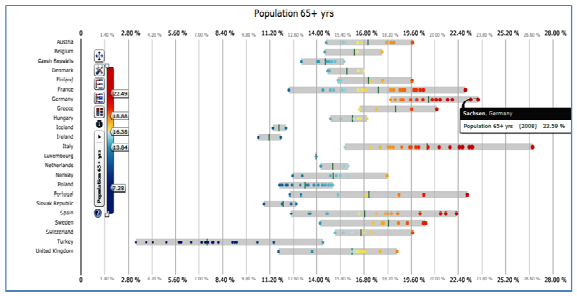
Table Grid

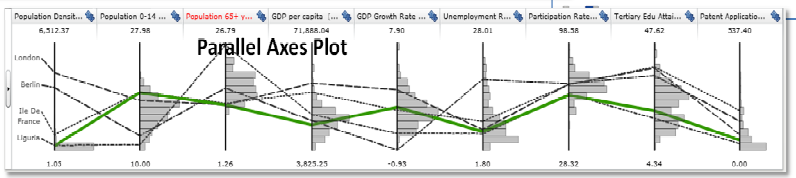


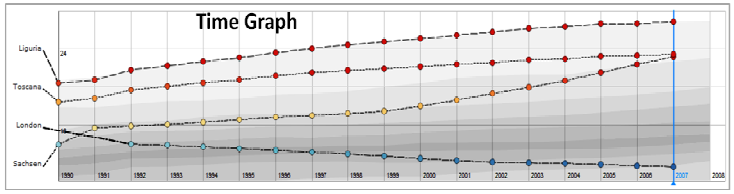




Regional Distribution Plot

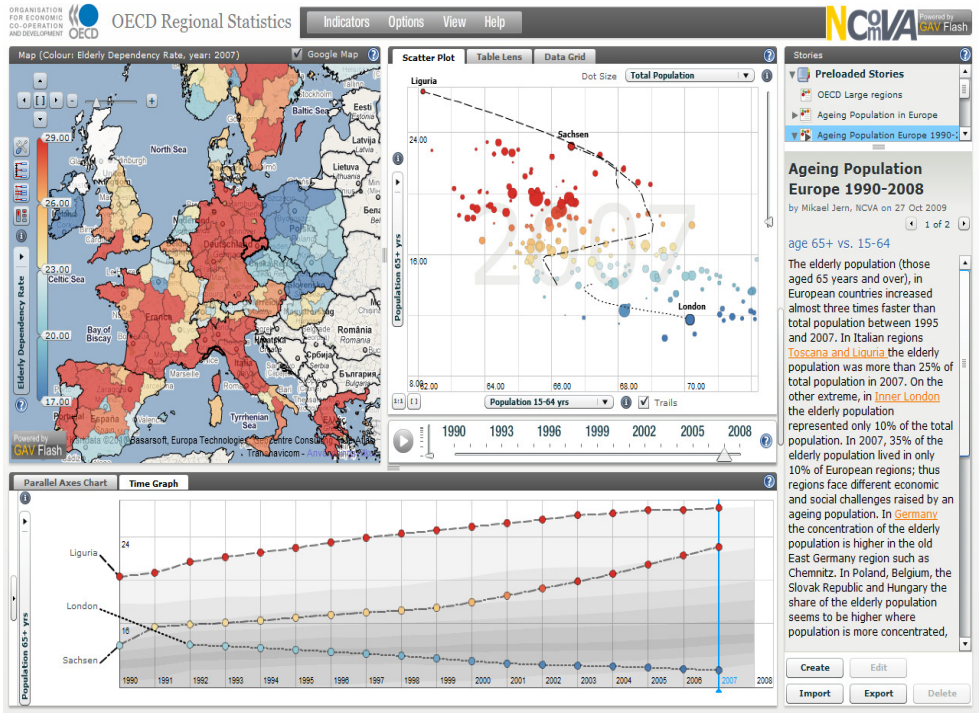


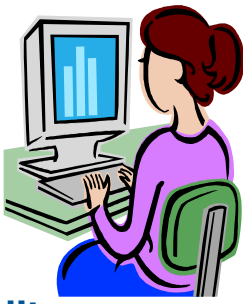




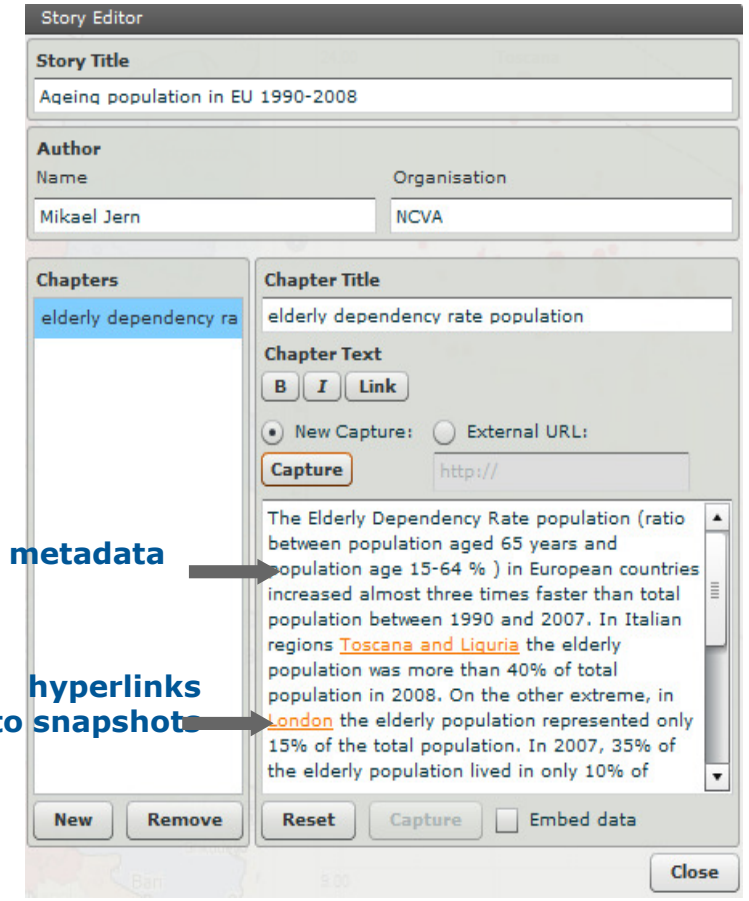
Step 3 Statistics eXplorer – analytic and authoring tool

Start writing your Story - Story Editor





Story Editor

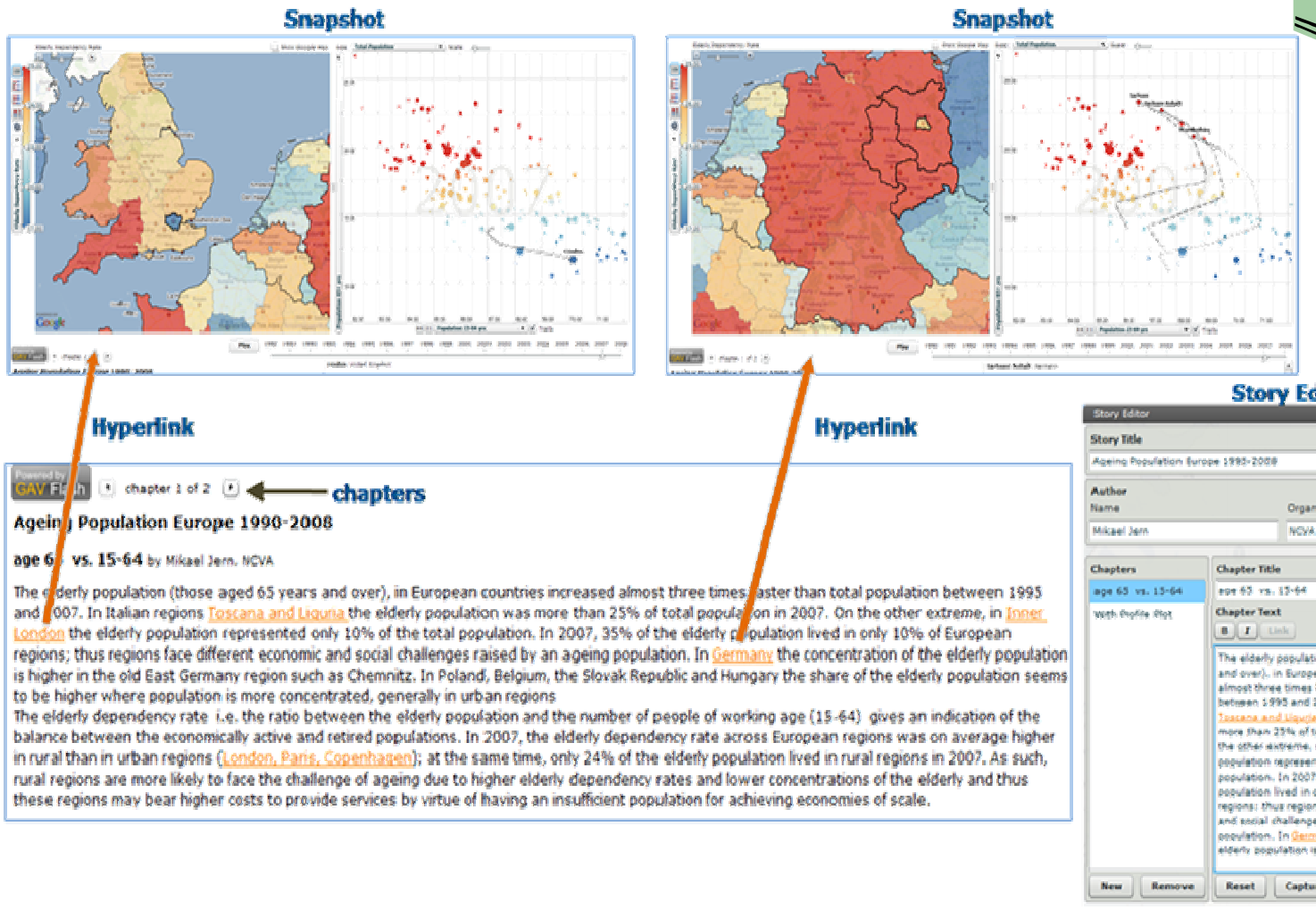


metadata

hyperlinks to snapshots

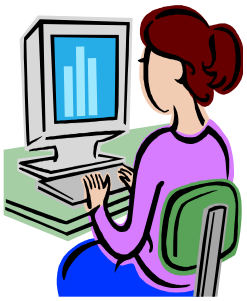
Step 4 Statistics eXplorer – analytic and authoring tool

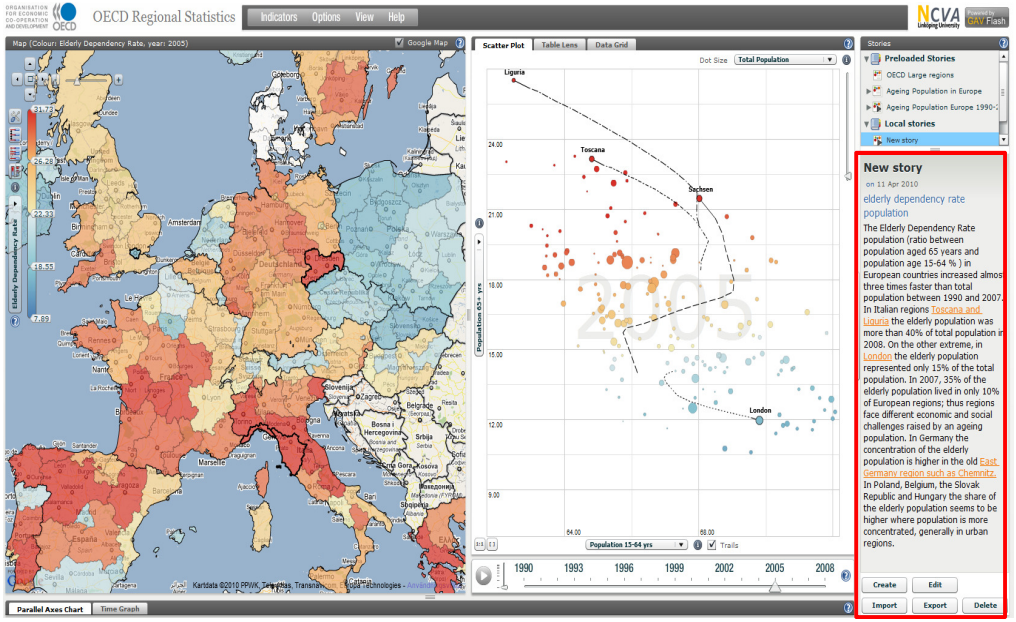
Start writing your Story – use snapshots to highlight (capture) special interesting insights and knowledge

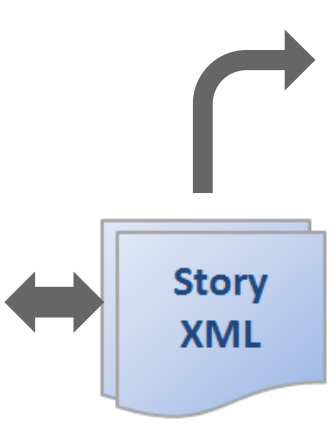


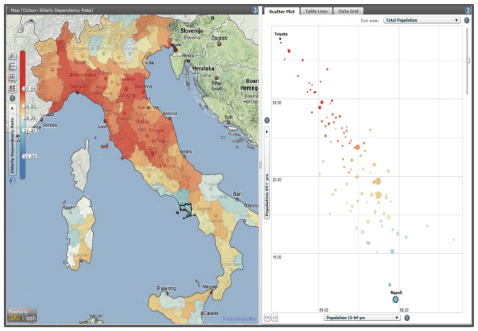
Step 5 Statistics eXplorer – *analytic and authoring tool*

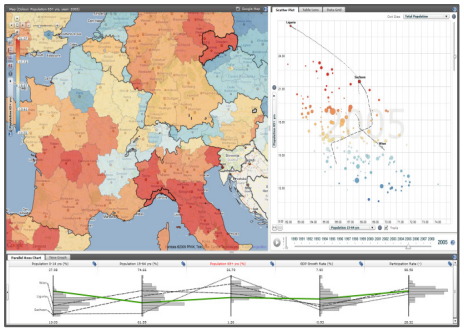
Share the Story with expert colleagues and reach consensus and trust – The Story is imported by your colleagues with OECD Regional Statistics and evaluated and if needed updated and returned to the author









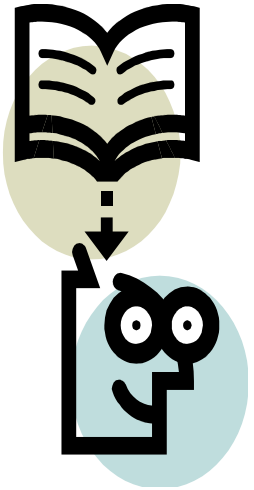


Returned comments

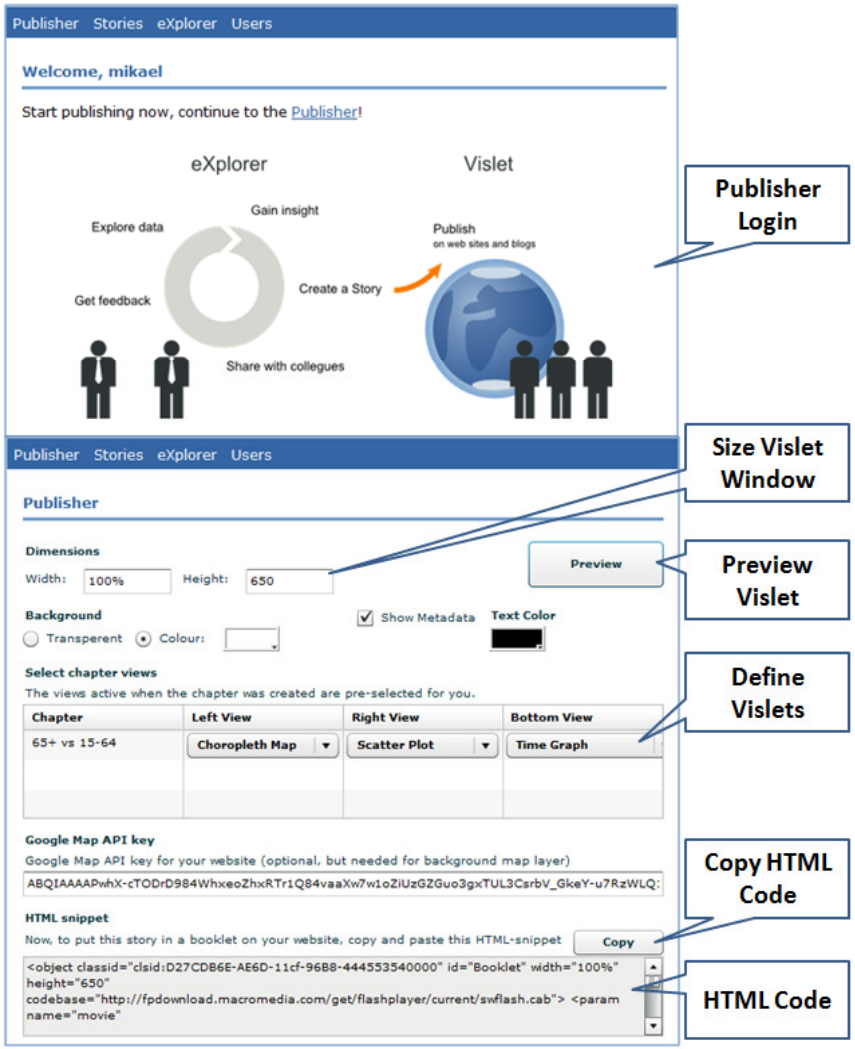
Step 6a

Statistics Publisher – *Publish the Story*

Import Story - Select visualization methods for Vislet



Story XML



Publisher Login

Size Vislet Window

Preview Vislet

Define Vislets

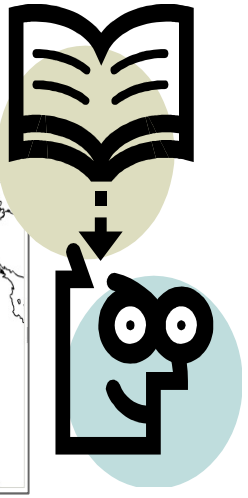
Copy HTML Code

HTML Code

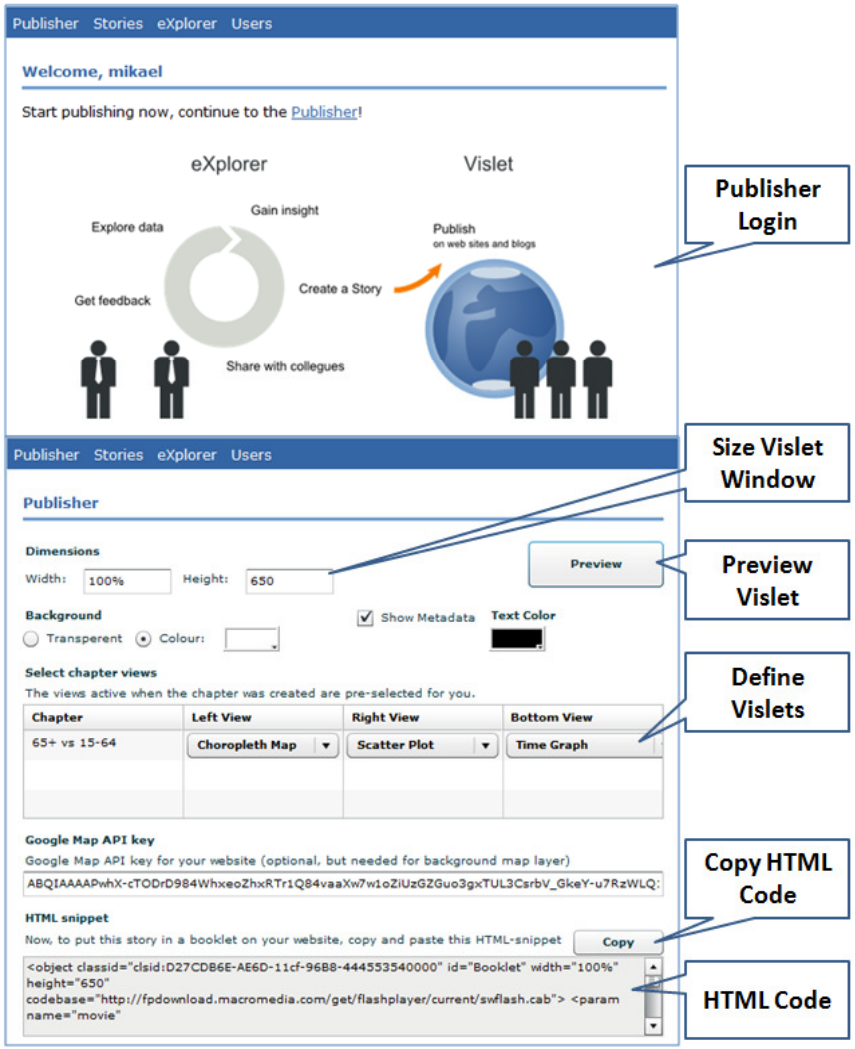
Step 6b

Statistics Publisher – *Publish the Story*

Import Story - Select visualization methods for Vislet



Story XML



Publisher Login

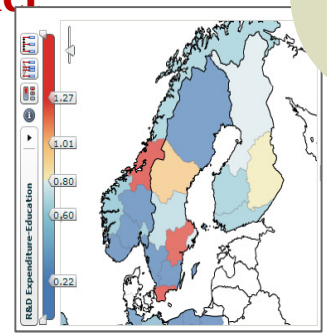
Size Vislet Window

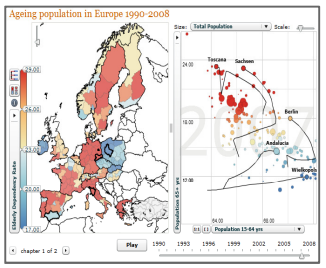
Preview Vislet

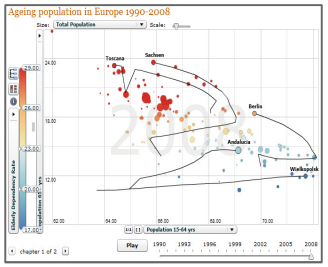
Define Vislets

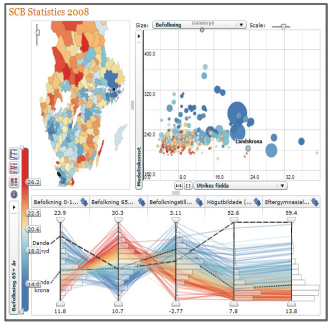
Copy HTML Code

HTML Code





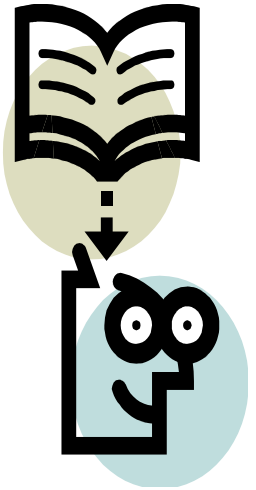




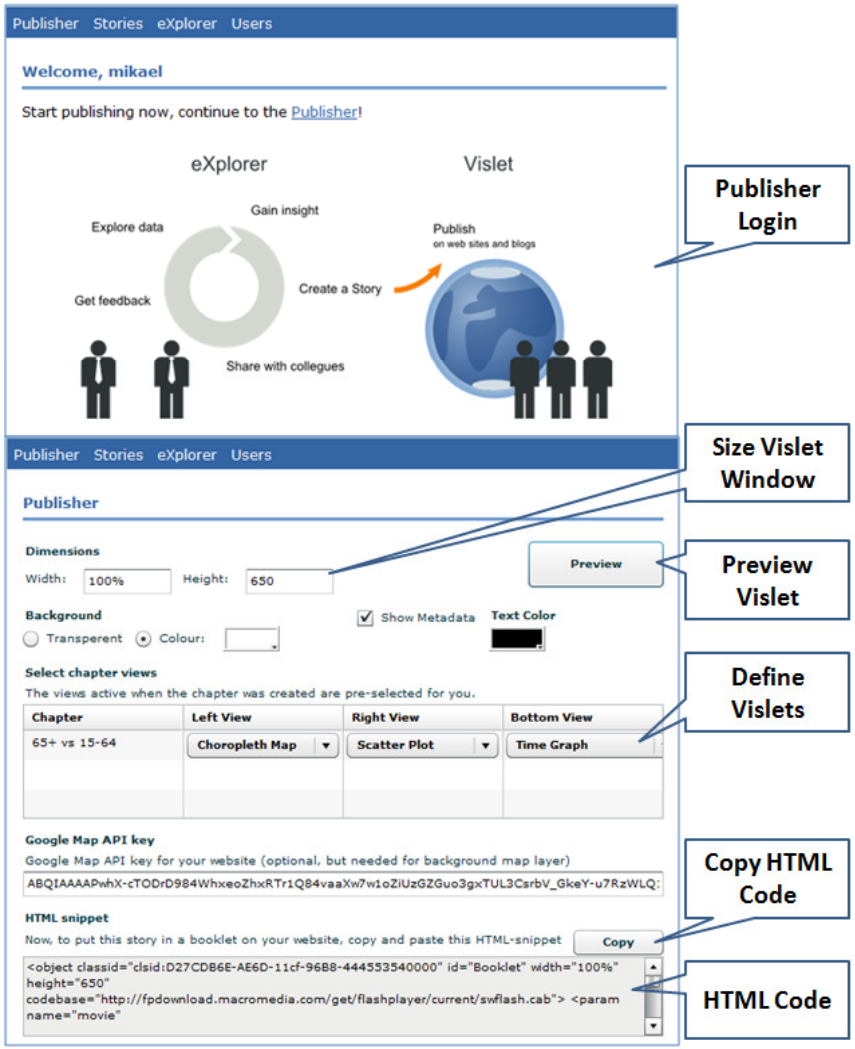
Step 6c

Statistics Publisher – *Publish the Story*

Preview Vislet



Story XML



Publisher Login

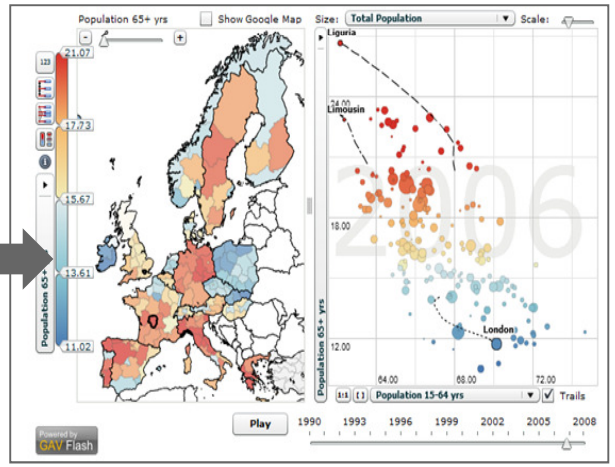
Size Vislet Window

Preview Vislet

Define Vislets

Copy HTML Code

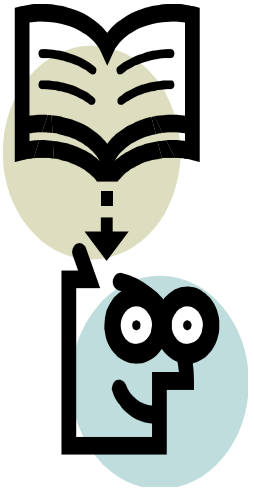
HTML Code



Step 6d

Statistics Publisher – *Publish the Story*

Produce the HTML code



Story XML

Publisher Login

Size Vislet Window

Preview Vislet

Define Vislets

Copy HTML Code

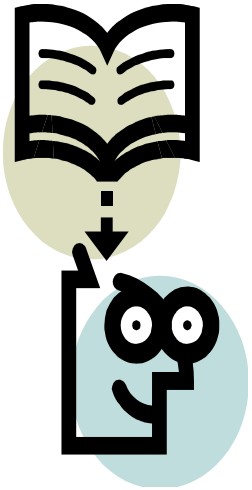
HTML Code

HTML code

```
<object classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" id="Vislet" width="100%" height="650"
codebase="http://fpdownload.macromedia.com/get/flashplayer/current/swflash.cab">

<param name="movie"
value="www.mydomain.com/explorer/Vislet.swf?components=(ChoroplethMap,ScatterPlot)&amp;amp;story=myStory.xml&amp;amp;backgroundColor=#ffffff&amp;amp;textColor=0&amp;amp;showMetadata=true&amp;amp;metaHeight=300&amp;amp;GoogleMapsKey=myGoogleKey"></param>

<param name="quality" value="high"></param>

<param name="allowScriptAccess" value="always"></param>

<param name="bgcolor" value="#ffffff"></param>

<embed src="www.mydomain.com/explorer/" quality="high" width="100%" height="650"
name="Booklet" align="middle" play="true" loop="false" allowScriptAccess="always"
type="application/x-shockwave-flash"
flashVars="components=(ChoroplethMap,ScatterPlot)&amp;amp;story=myStory.xml&amp;amp;backgroundColor=#ffffff&amp;amp;textColor=0&amp;amp;showMetadata=true&amp;amp;metaHeight=300&amp;amp;GoogleMapsKey=myGoogleKey" pluginspage="http://www.adobe.com/go/getflashplayer"
bgcolor="#ffffff"></embed>

</object>
```

Step 7

Statistics Publisher – *Publish the Story*



Embed (drop) the HTML code in a Blog (or HTML page)

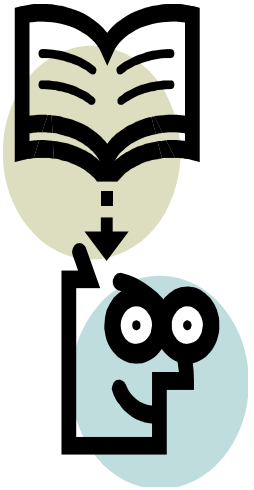
HTML code

```
<object classid="clsid:D27CDB6E-AE6D-11cf-96B8-444553540000" id="Vislet" width="100%"
height="650"
codebase="http://fpdownload.macromedia.com/get/flashplayer/current/swflash.cab">

<param name="movie"
value="www.mydomain.com/explorer/Vislet.swf?components=(ChoroplethMap,ScatterPlot)&
amp;story=myStory.xml&amp;backgroundColor=#ffffff&amp;textColor=0&amp;showMetadat
a=true&amp;metaHeight=300&amp;GoogleMapsKey=myGoogleKey"></param>

<param name="quality" value="high"></param>

<param name="allowScriptAccess" value="always"></param>

<param name="bgcolor" value="#ffffff"></param>

<embed src="www.mydomain.com/explorer/" quality="high" width="100%" height="650"
name="Booklet" align="middle" play="true" loop="false" allowScriptAccess="always"
type="application/x-shockwave-flash"
flashVars="components=(ChoroplethMap,ScatterPlot)&amp;story=myStory.xml&amp;backgro
undColor=#ffffff&amp;textColor=0&amp;showMetadata=true&amp;metaHeight=300&amp;Go
ogleMapsKey=myGoogleKey" pluginspage="http://www.adobe.com/go/getflashplayer"
bgcolor="#ffffff"></embed>

</object>
```

Step 8

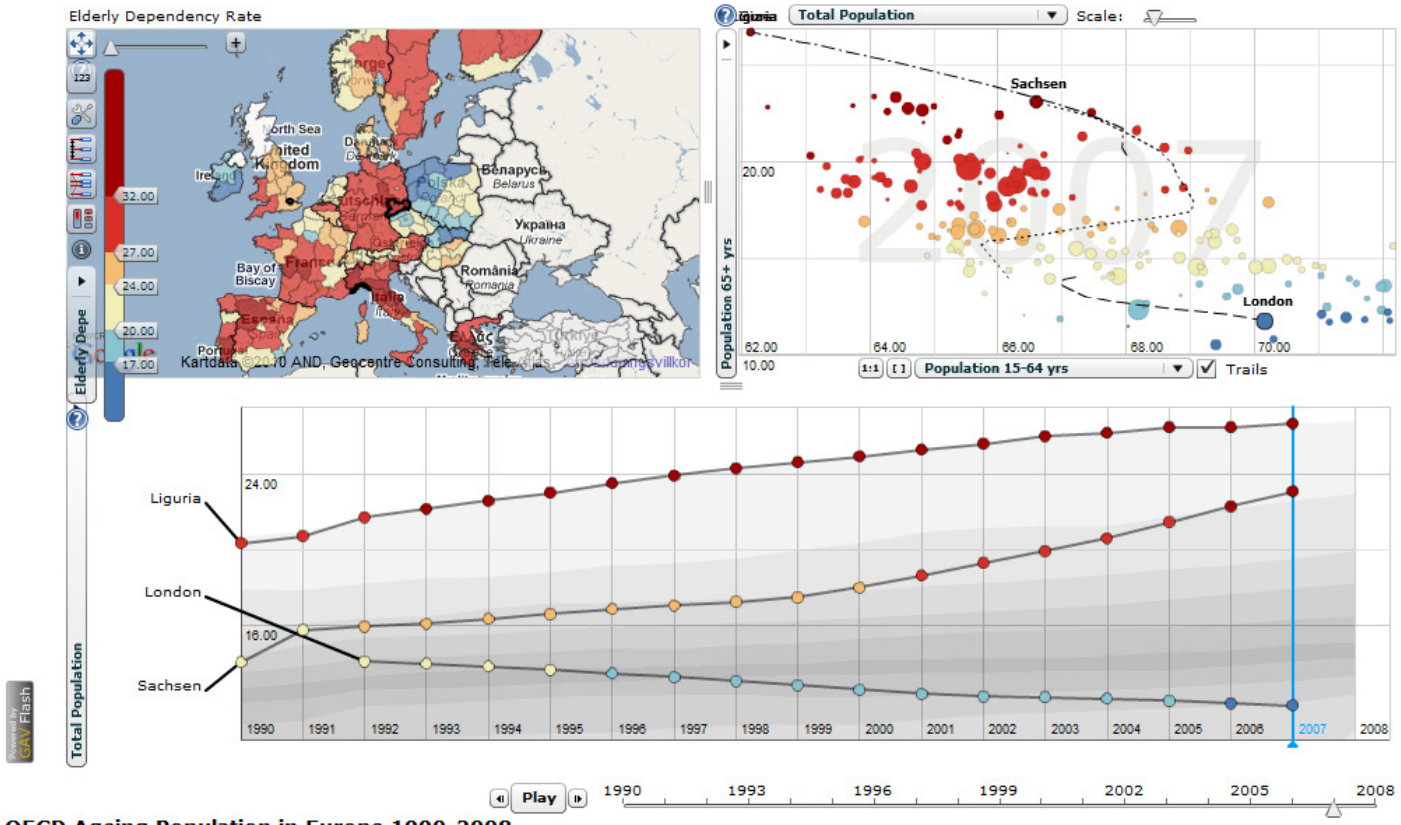
Statistics Publisher – *Publish the Story*

A Vislet with Metadata is now Published about ageing population in Europe



NCoMVA Statistics Publisher Blog

OECD eXplorer Vislet ageing population in Europe 1990-2008



OECD Ageing Population in Europe 1990-2008

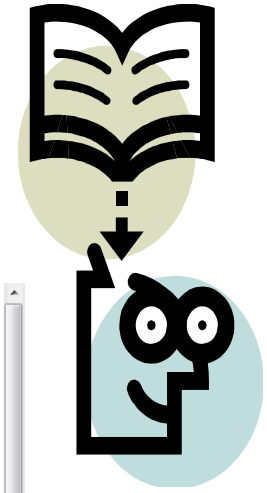
pop age 65+ vs. pop age 15-64 by Mikael Jern, NComVA

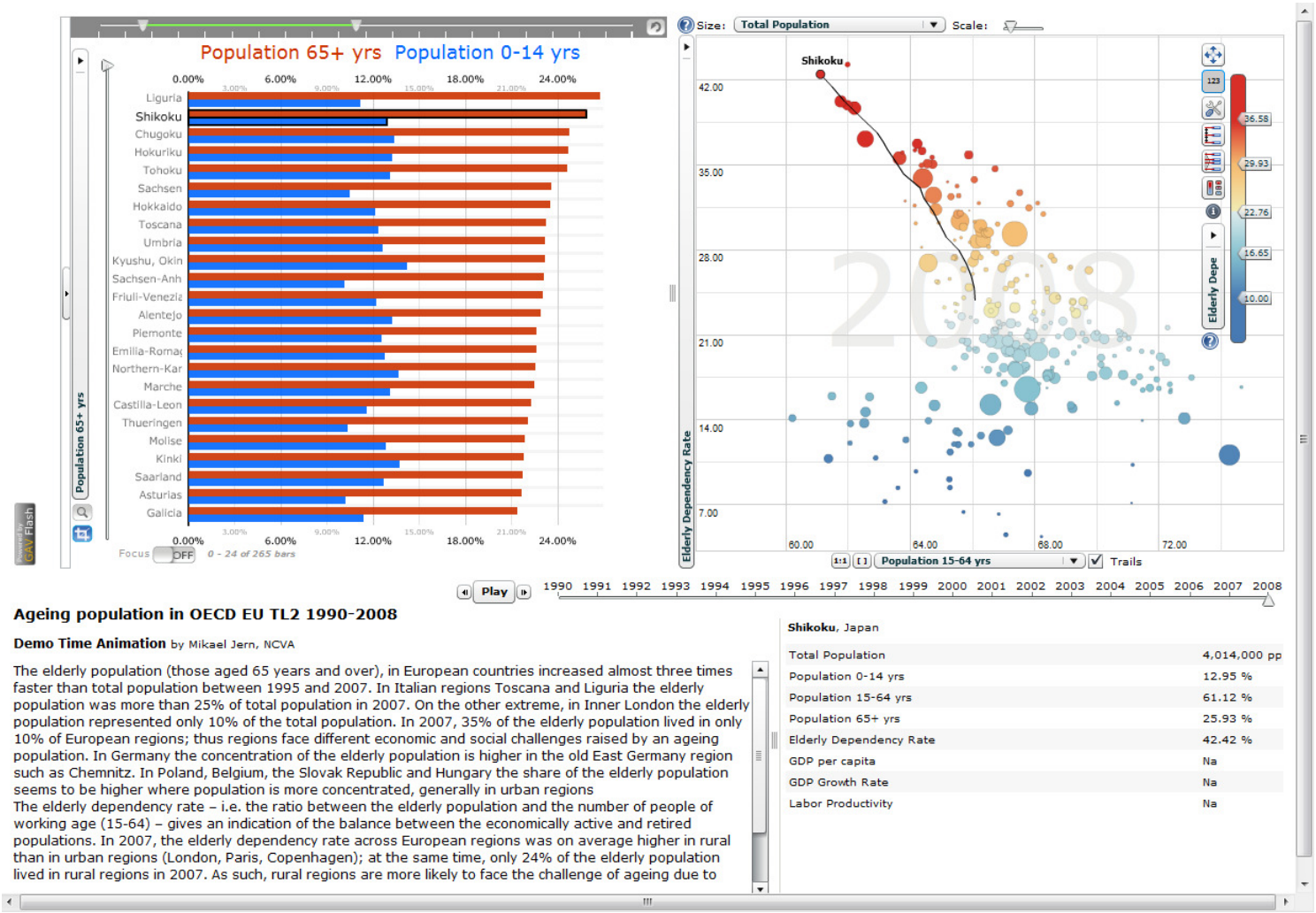
The elderly population (those aged 65 years and over), in European countries increased almost three times faster than total population between 1995 and 2007. In Italian regions Toscana and Liguria the elderly population was more than 25% of total population in 2007. On the other extreme, in Inner London the elderly population represented only 12% of the total population. In 2007, 35% of the elderly population lived in only 10% of European regions; thus regions face different economic and social challenges raised by an ageing population. In Germany the concentration of the elderly population is higher in the old East Germany region such as Sachsen. In Poland, Belgium, the Slovak Republic and Hungary the share of the elderly population seems

Step 9

Statistics Publisher – *Publish the Story*

and here with Histogram and Scatter Plot





Ageing population in OECD EU TL2 1990-2008

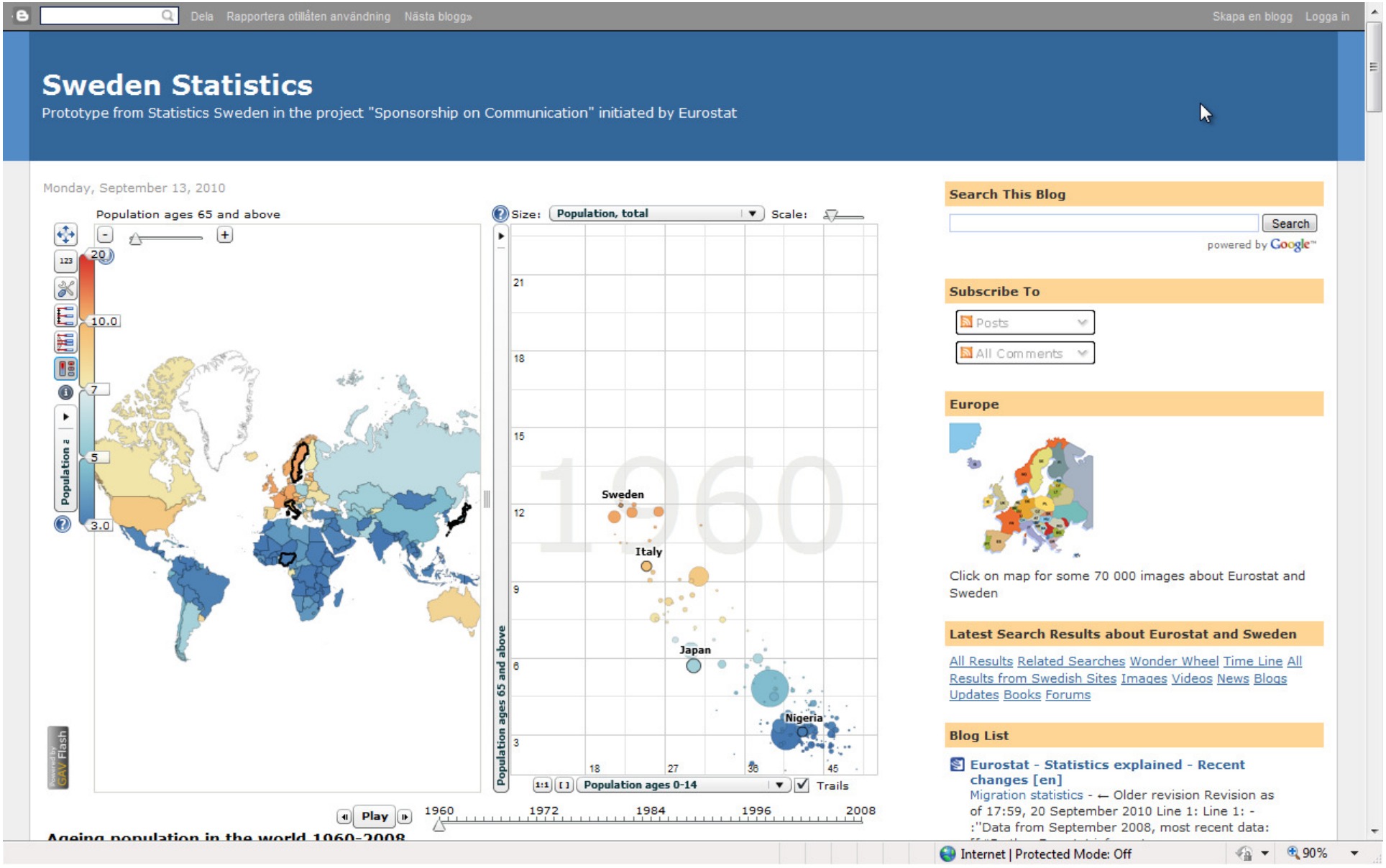
Demo Time Animation by Mikael Jern, NCVA

The elderly population (those aged 65 years and over), in European countries increased almost three times faster than total population between 1995 and 2007. In Italian regions Toscana and Liguria the elderly population was more than 25% of total population in 2007. On the other extreme, in Inner London the elderly population represented only 10% of the total population. In 2007, 35% of the elderly population lived in only 10% of European regions; thus regions face different economic and social challenges raised by an ageing population. In Germany the concentration of the elderly population is higher in the old East Germany region such as Chemnitz. In Poland, Belgium, the Slovak Republic and Hungary the share of the elderly population seems to be higher where population is more concentrated, generally in urban regions
The elderly dependency rate – i.e. the ratio between the elderly population and the number of people of working age (15-64) – gives an indication of the balance between the economically active and retired populations. In 2007, the elderly dependency rate across European regions was on average higher in rural than in urban regions (London, Paris, Copenhagen); at the same time, only 24% of the elderly population lived in rural regions in 2007. As such, rural regions are more likely to face the challenge of ageing due to

Shikoku, Japan

Total Population	4,014,000 pp
Population 0-14 yrs	12.95 %
Population 15-64 yrs	61.12 %
Population 65+ yrs	25.93 %
Elderly Dependency Rate	42.42 %
GDP per capita	Na
GDP Growth Rate	Na
Labor Productivity	Na

Vislet embedded in the Sweden Statistics Blog - DEMO



Vislet embedded in the Sweden Statistics Blog

Way forward

- Use eXplorer Statistics Publisher to produce online publications following a defined model
- Statistics Publisher as a repository of evidence, facts to spur discussion on regional performance, quality of life in different communities
- Use Statistics Publisher in Media (Economist, etc.)

NCVA
National Center for Visual Analytics
Linköpings universitet
expanding reality

ICAS - V
13 - 15 October 2010,
Kampala, Uganda

Many Thanks!

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
OECD
Statistiska centralbyrån
Statistics Sweden
eurostat
Sveriges Kommuner och Landsting
City of Göteborg
STATISTICS DENMARK
Istat.it
The World Bank
IBRD & IDA: Working for a World Free of Poverty

IN PARTNERSHIP WITH THE
Knowledge Foundation
VINNOVA

Questions?

http://ncva.itn.liu.se/