

– Sina ja mina,  
me kõik,  
üheskoos!

3.– 4. aprill  
Eesti Arstide  
Päevad 2019  
Viljandi Ugala teater

Eesti Arstide Liit



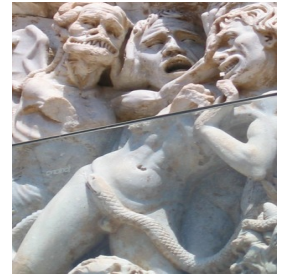
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## Vaccination of 50+ adults to promote healthy ageing



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GInGer



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du Processus Inflammatoire

UNIVERSITÉ  
**Grenoble  
Alpes**

UFR de Médecine  
UNIVERSITÉ  
**Grenoble  
Alpes**

CHU  
GRENOBLE  
ALPES

UC OG Alp  
74 73 38

# Disclosure of interest

**As consultant**, speaker, workshop and advisory boards : Pfizer/ BioMérieux/ Sanofi-Pasteur MSD/ Astellas /AstraZeneca/Sanofi / MSD

**Invitation for congress** : Eisai, Pfizer, Sanofi Pasteur, Novartis, Pfizer, MSD

# Preambule 1 : Geriatric in France

Population : 67 M inhabitants  
>25% pop > 65y and 12% > 75y

Physician : 296 000

Geriatrician : 4 000

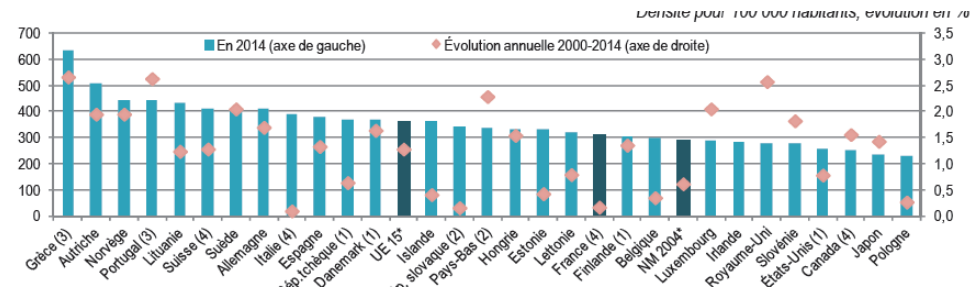
French geriatric society: 1 congress/ y ( 1800 p)

Geriatric : - speciality from 2004

- Full speciality from 2017

200 fellows / year after Medical school (6 years)

- duration : 4 years ( e-learning\_ flipped classroom



Topics : Acute care, Rehabilitation, Geriatric assessment, Oncogeriatric, Orthogeriatric, Pharmacogeriatric....

Prevention of disability : internal medicine + functional assessment

# Preamble 2 : Vaccination as Individual / Collective issues

- Diseases and complications of the Diseases
- Vaccine : Efficacy- effectiveness / Adverse drug reaction ratio
- Cost /Effectivness ratio
  - Incidence and prevalence of the disease
  - Cost (dis+complications) versus cost (Vaccine /ADR)

**Individual** perception of  
Efficacy- effectiveness / Adverse drug reaction ratio

**Collective** Vaccine policies (Public Health policies)  
Individual interest / Collective interest  
**Cost /Effectiveness ratio**



# Summary

- What is « healthy ageing » / Active ?
- Scientific evidence of ID (VPD) impact on ageing - role of vaccine ?
- Vaccine Policies , Evidences?

# Healthy Ageing

## General Concept

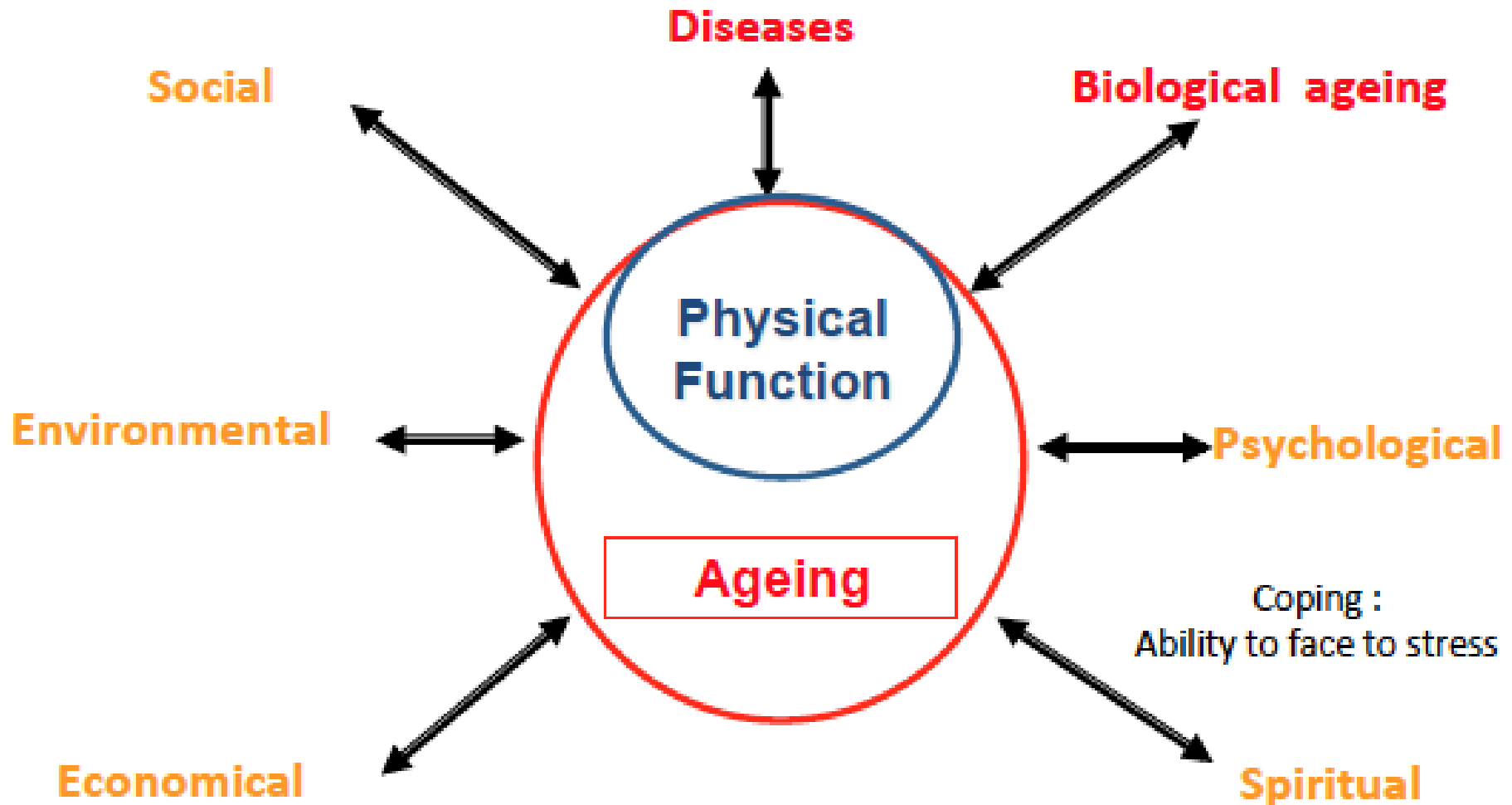
Result of the individual perception of his own ageing through the definition of well-being and Health

« *Healthy ageing is the process of **optimising** opportunities for physical, social and mental health to enable older people to take an **active** part in society without discrimination and to enjoy an **independent** and good **quality of life**.* »

*EU definition for EIT/EIP  
Healthy ageing projects*

# Healthy Ageing

enjoy an *independent* and good *quality of life*.





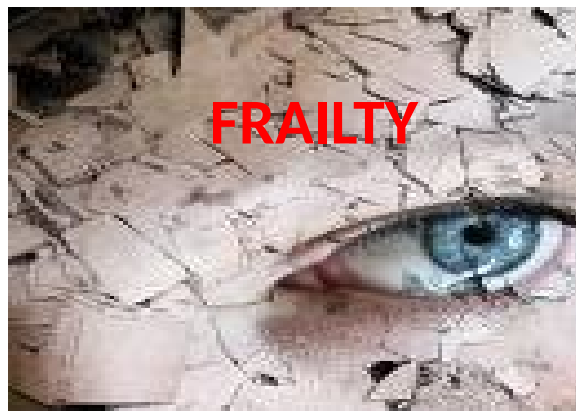
If Ageing is Universal, Intrinsec, Progressive and somehow Deleterious  
Ageing is

Environment →  
(comorbidity)

**HETEROGENEOUS**

← Genetic  
Epigenetic

80% OF >80 Y POP. AT HOME WITHOUT any DISABILITY





# AGEING, heterogeneous older population



From healthy



Frailty

Ageing



to Pathologic  
**DISABLE**

# The older persons

## One trigger = several complications

### Numerous unexpected complications

Iatrogenic events,  
Health care Associated Infection  
Falls  
Malnutrition  
Immobilisation / pressure sores  
Delirium /behavioural disorders  
Complications of Chronic Diseases  
( known or unknown)

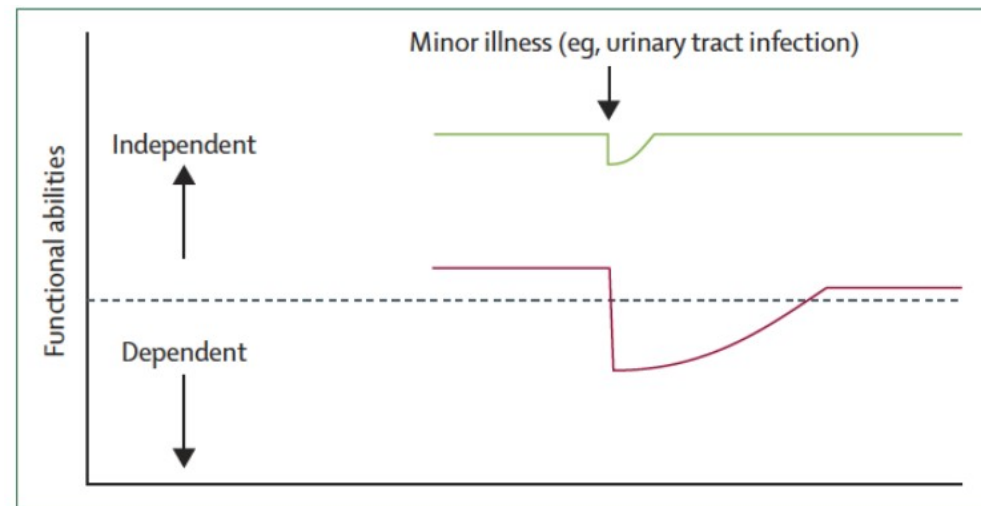
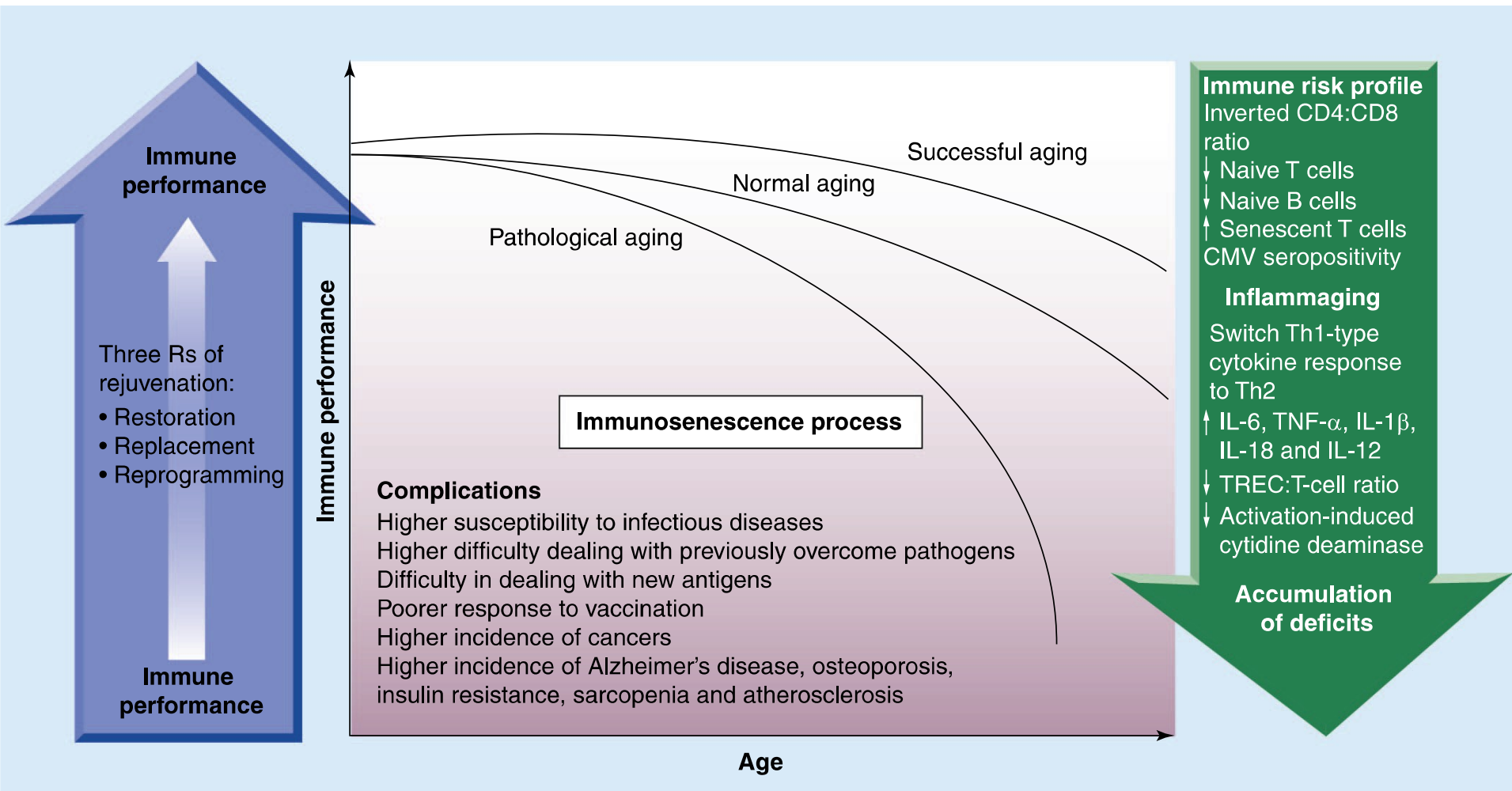


Figure 1: Vulnerability of frail elderly people to a sudden change in health status after a minor illness

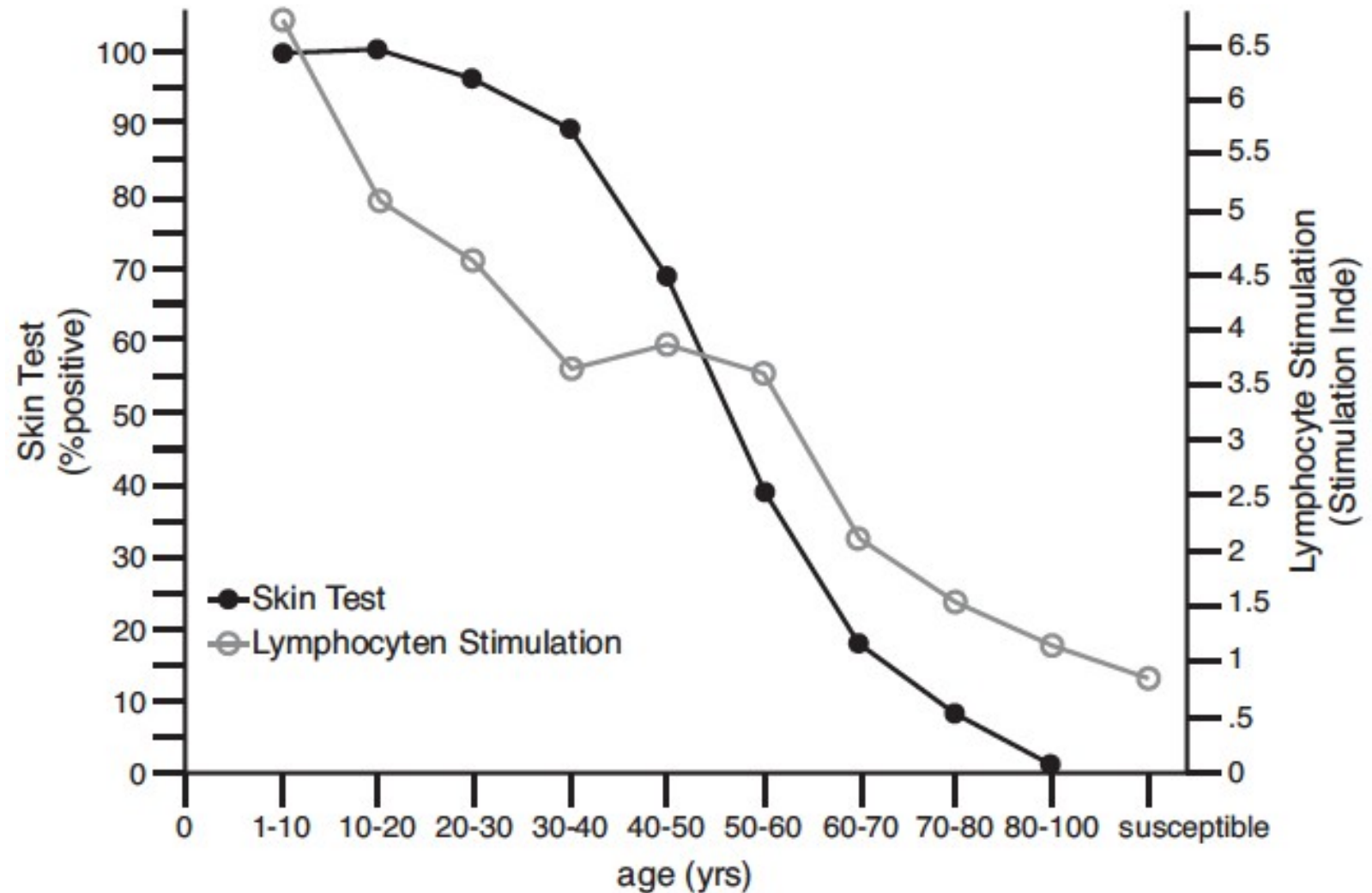
## Disability

□□ in hospital length of stay and □□□ cost

# Immunosenescence, everywhere !!!!

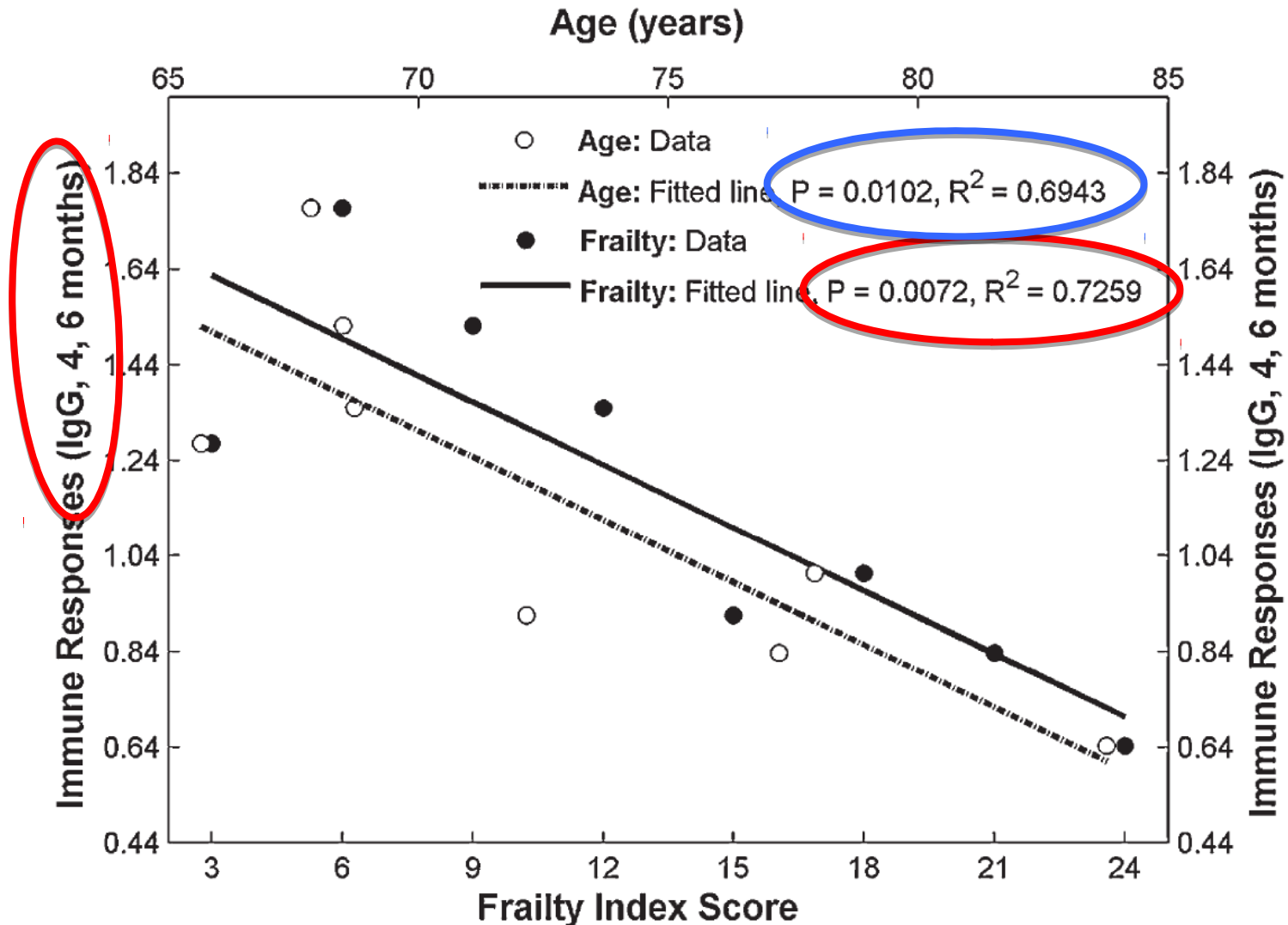


# age-related Immunological response to VZV antigen



# Frailty, Immunosenescence, Pneumococcal vaccines

## Frailty and immune response PCV7 & PPV23



# Seroprotection Immune response In elderly

	Pre-vaccination	Post-vaccination
Seroprotection rate, % (95% CI)		
Diphtheria ( $\geq 0.1$ IU/mL)	<u>45.4 (40.8–50.0)</u> n = 452	<u>85.4 (81.8–88.3)</u> n = 451
<b>Tetanus (<math>\geq 0.1</math> IU/mL)</b>	<u>95.9 (93.7–97.4)</u> <u>n = 443</u>	<u>100.0 (99.1–100.0)</u> <u>n = 444</u>
Poliomyelitis type 1 ( $\geq 8$ 1/dil)	96.8 (94.6–98.1) n = 433	99.8 (98.7–99.9) n = 433
Poliomyelitis type 2 ( $\geq 8$ 1/dil)	95.8 (93.5–97.4) n = 433	100.0 (99.1–100.0) n = 433
Poliomyelitis type 3 ( $\geq 8$ 1/dil)	94.2 (91.6–96.1) n = 433	99.3 (98.0–99.8) n = 433
Participants with titres $> 5$ EU/mL, % (95% CI)		
<b>Pertussis toxoid antibody</b>	<u>66.7 (62.2–71.0)</u> n = 442	<u>94.3 (91.7–96.1)</u> n = 436
Filamentous HA antibody	97.3 (95.4–98.5) n = 448	99.8 (98.7–99.9) n = 446
Pertactin antibody	54.0 (49.4–58.6) n = 446	97.3 (95.3–98.4) n = 443
Fimbriae 2 & 3 antibody	35.8 (31.4–40.4) n = 436	91.7 (88.7–93.9) n = 444

Mean age : 68 Y      N = >1500; . Multicentric France Germany

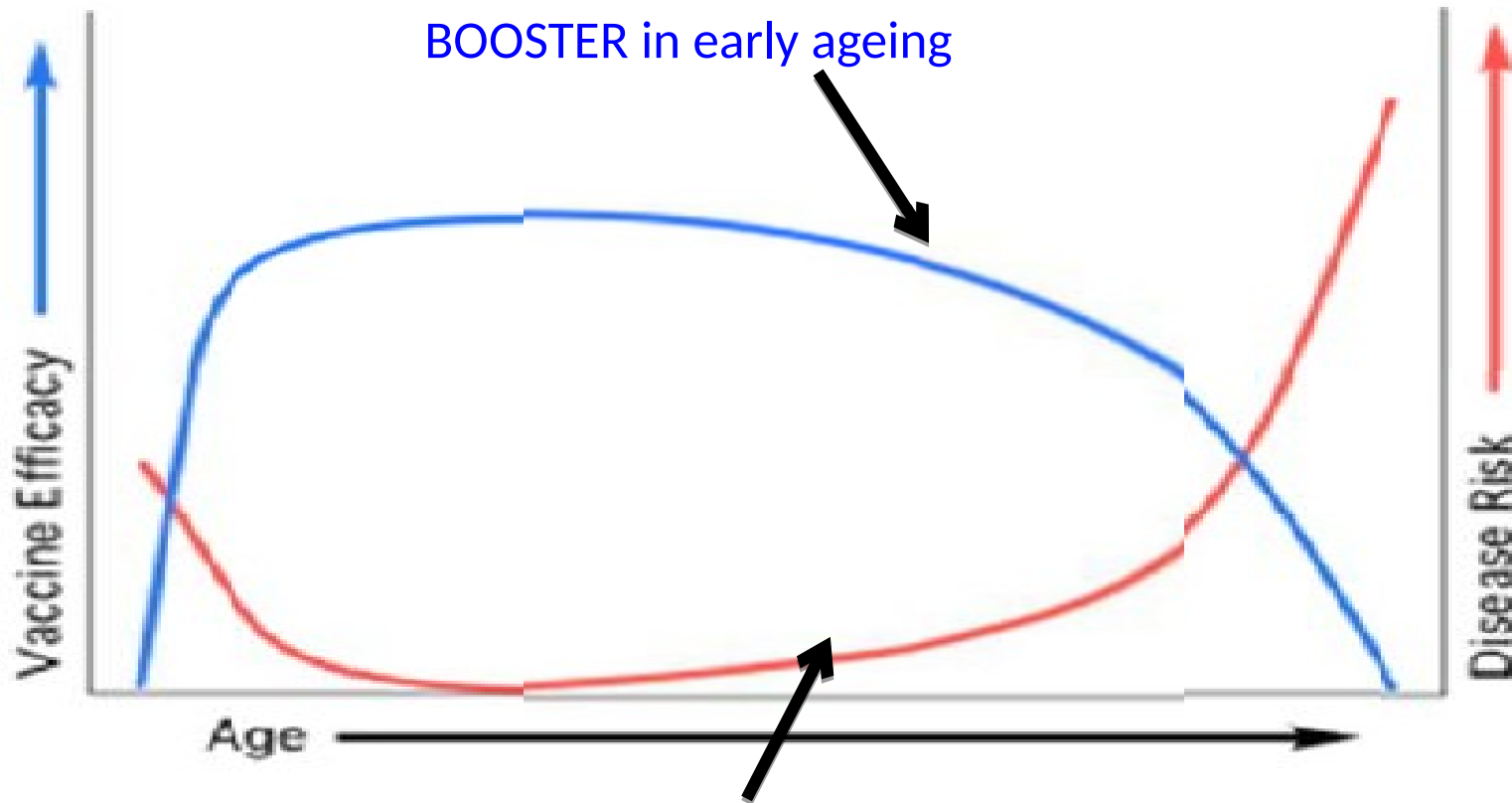
# Vaccine responses and ageing

Biomarkers are different  
varying from vaccine to another  
from a disease to another

Antibody titers (Pneumococcus/ flu / tetanos / Pertussis)  
T cytotoxic Proliferation : Zoster / pneumococcus

NO strict correlation between biomarkers and clinic  
=  
limitations to understand reasons for lower  
efficiency

# Rational for a long life vaccine program



**Better control fo Vaccine preventable diseases**



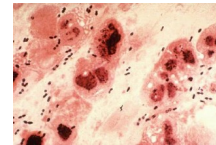
# THOM 1 Healthy Ageing : from biological and medical factors

- Less acute diseases (severe)
- Less Chronic diseases (severe)
- Less Disability associated Diseases/Ageing
- Less frailty associated Diseases/Ageing
- Less immunesenescence
- **NO real biomarkers of ageing process**



# Summary

- What is « healthy ageing » / Active ?
- Scientific evidence of ID (VPD) impact on ageing - role of vaccine ?



VPD  
Pneumococcus  
Influenza  
Zoster



- Vaccine Policies , evidences?



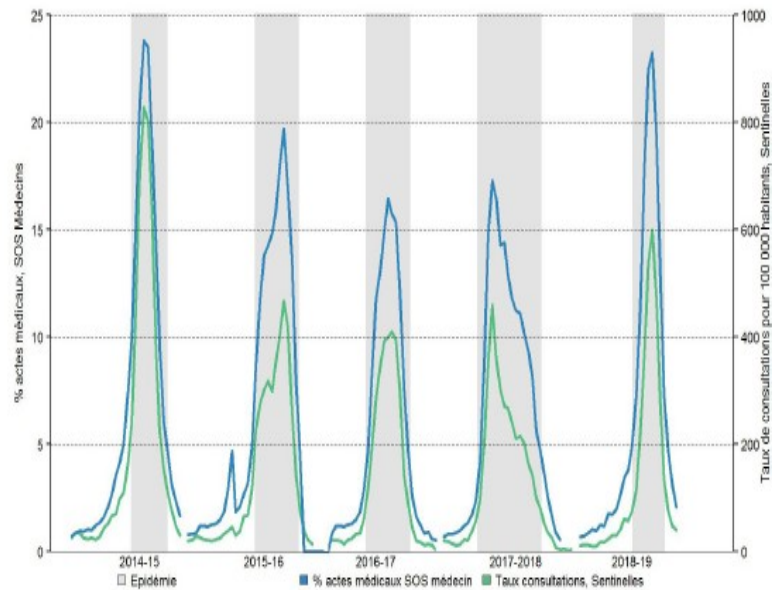
Overview

# Influenza

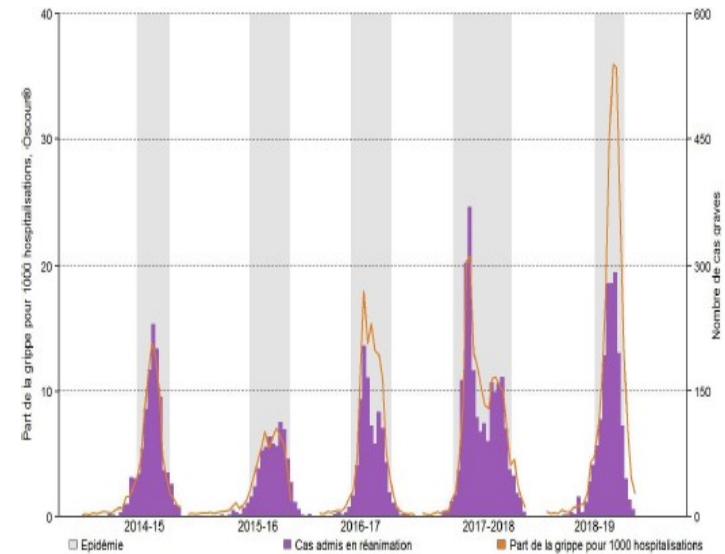
## overview / recommendation



# Influenza is highly variable, by area, settings... and year

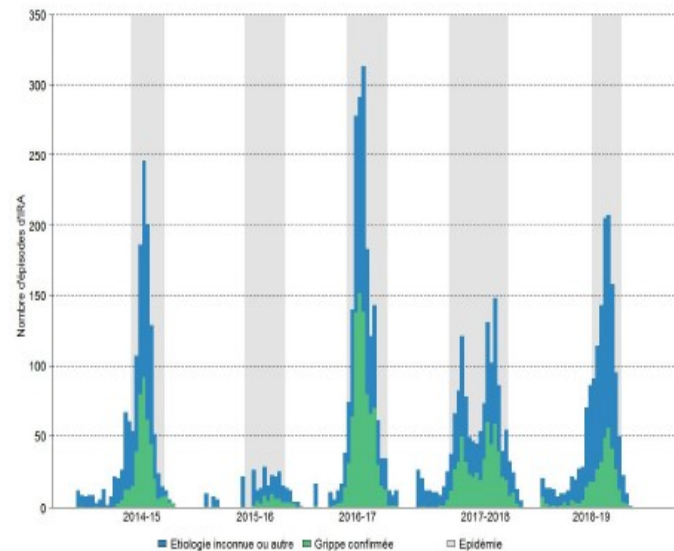


Ambulatory



Hospitalisation and ICU

Nursing Home



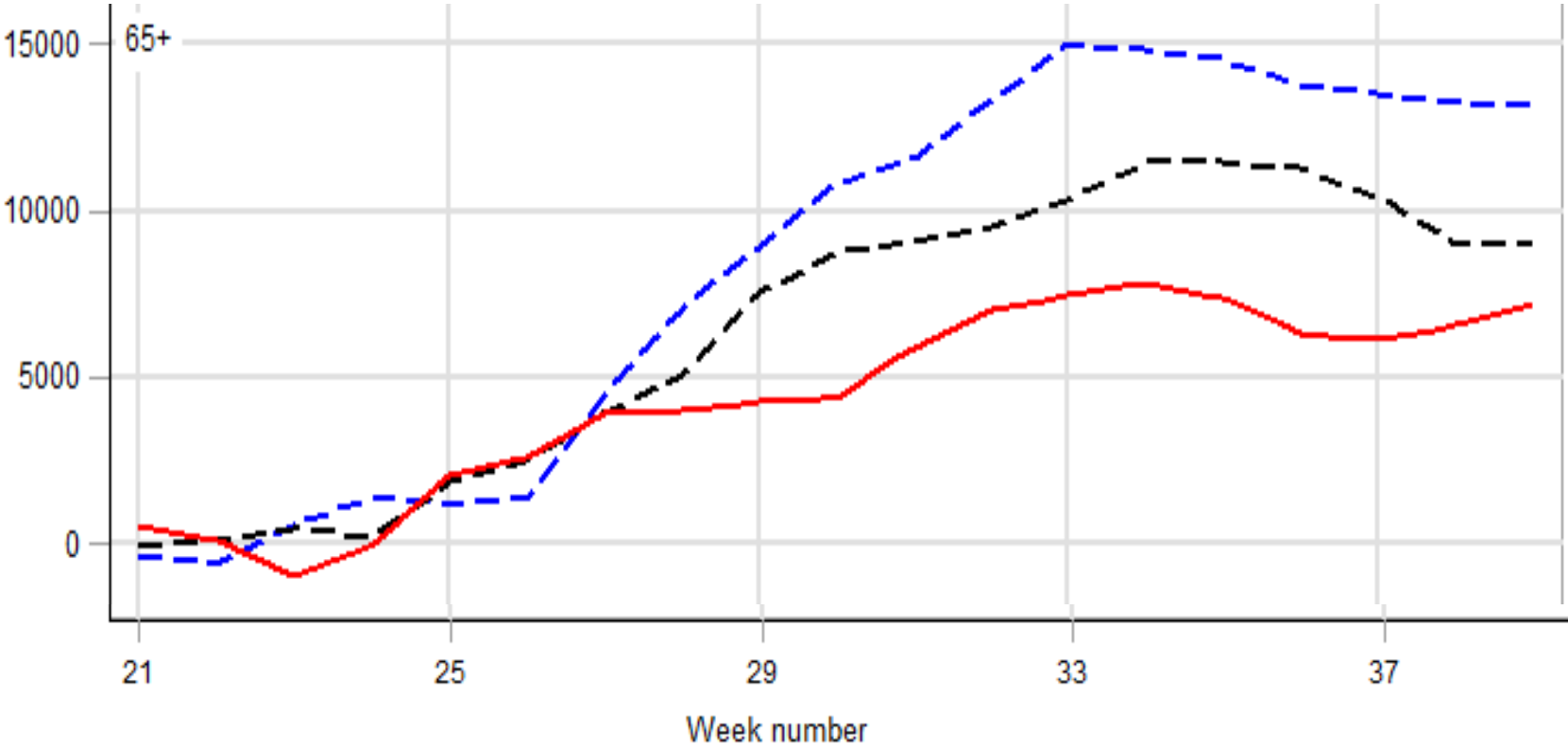
# Infection-related death- USA

Influenza & Pneumonia  
On death certificates



# Influenza-related death- Europe

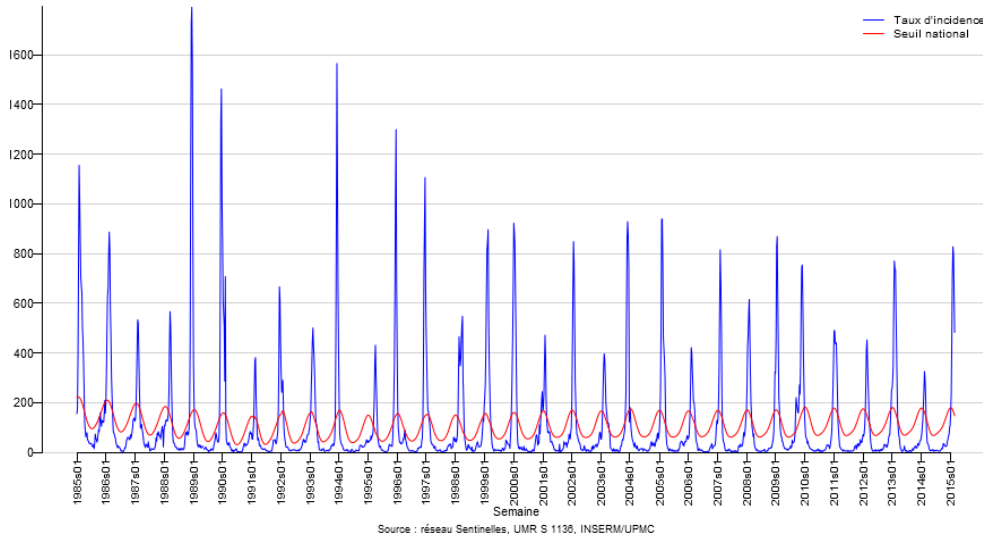
> 50 000 - 200 000  
Excess death per year



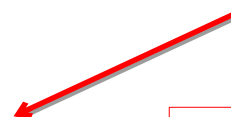
— 2017    - - - 2016    - - - 2015    - - - 2014    - - - 2013

# Influenza epidemiology

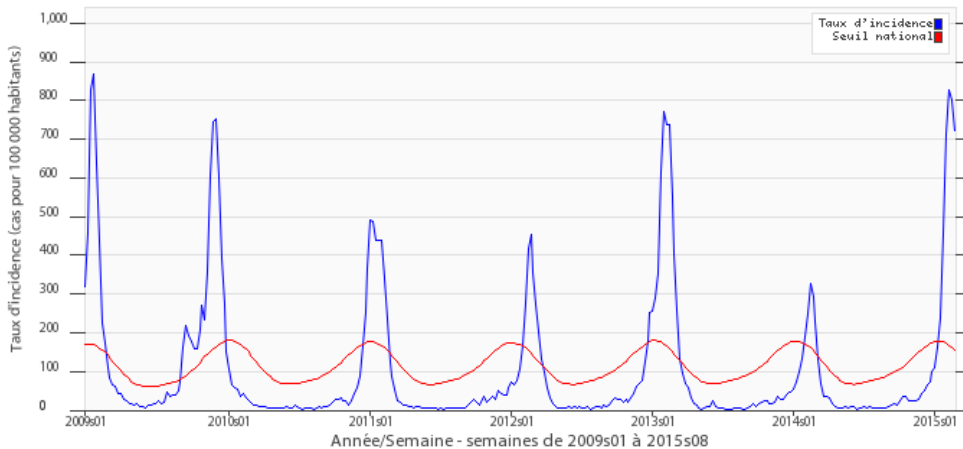
Syndromes grippaux, France métropolitaine



2014-2015  
13<sup>th</sup> flu Peak  
Over 30 years +18 000 Excess deaths



**Flu 2016/17**  
France : + 24 000 Deaths  
90% > 65 y  
14 440 related



**Flu 2017/2018**  
France : + 17 900  
Deaths  
13 000 related

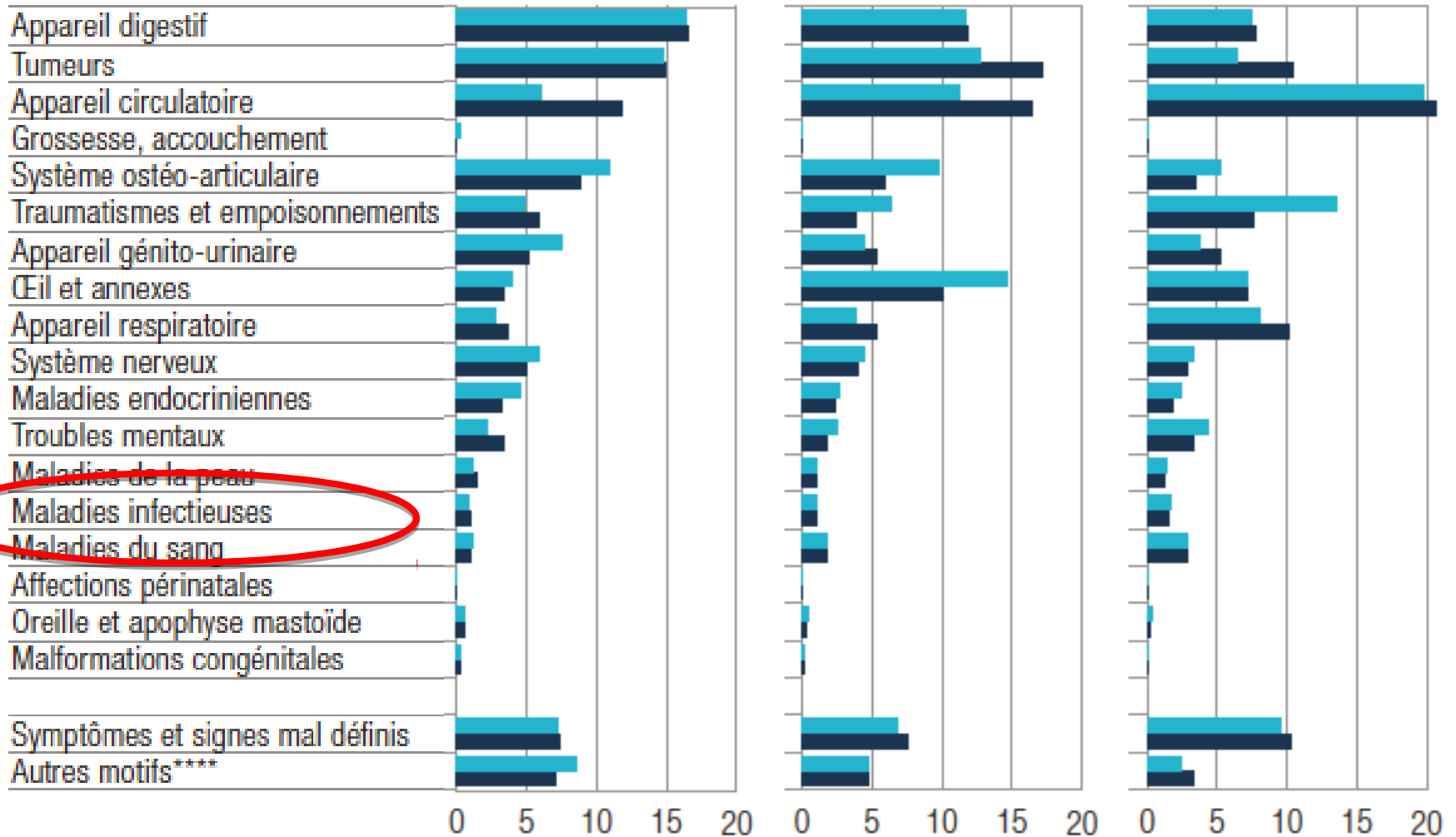
# Infection-related Death

Femmes Hommes

45 à 64 ans

65 à 84 ans

85 ans et plus





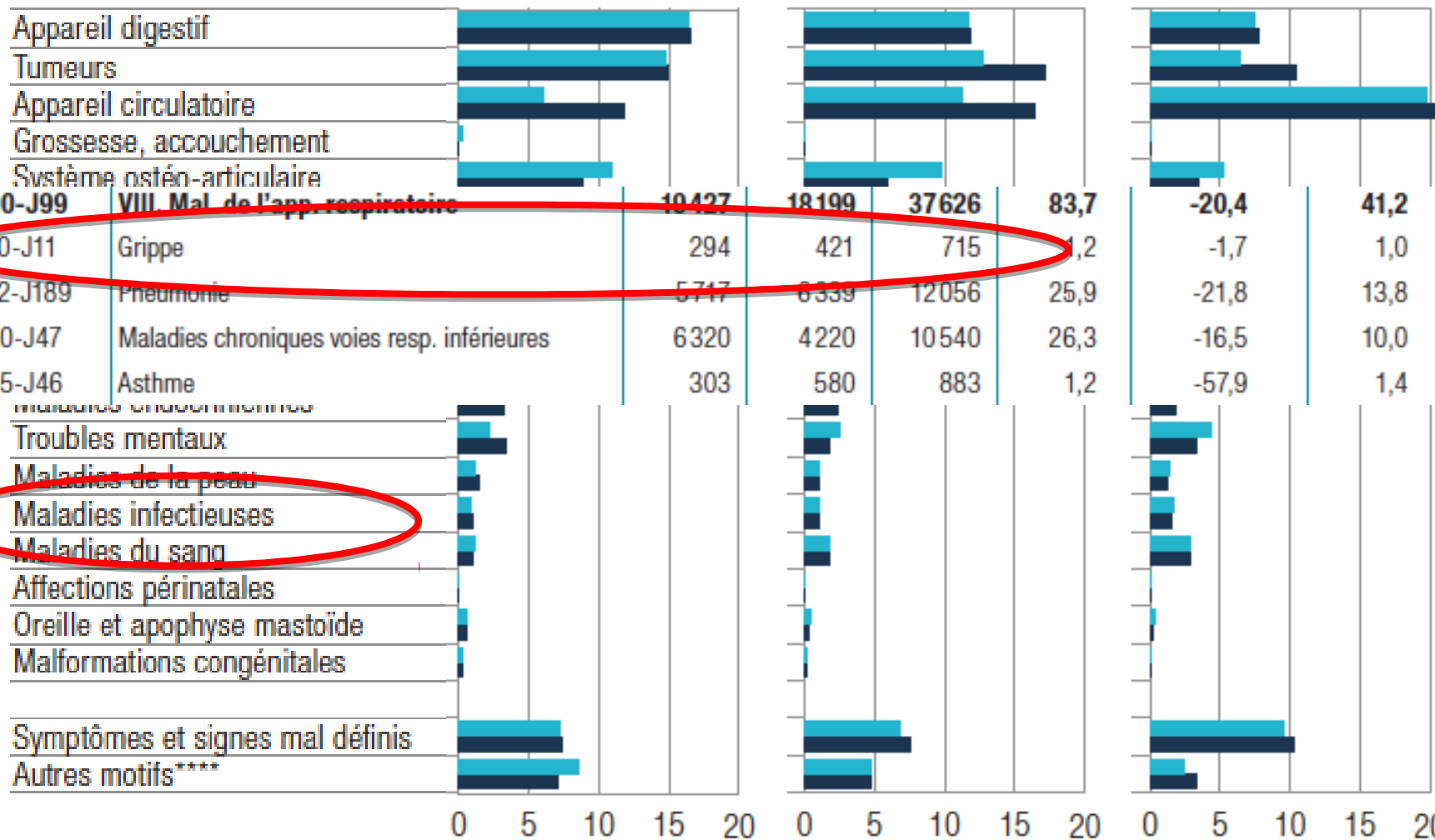
# Infection-related death

Femmes Hommes

45 à 64 ans

65 à 84 ans

85 ans et plus



Is it possible ? Couldn't it be confusing ?

Same year ..... >14 000 flu related death

death certificates less than < 1500

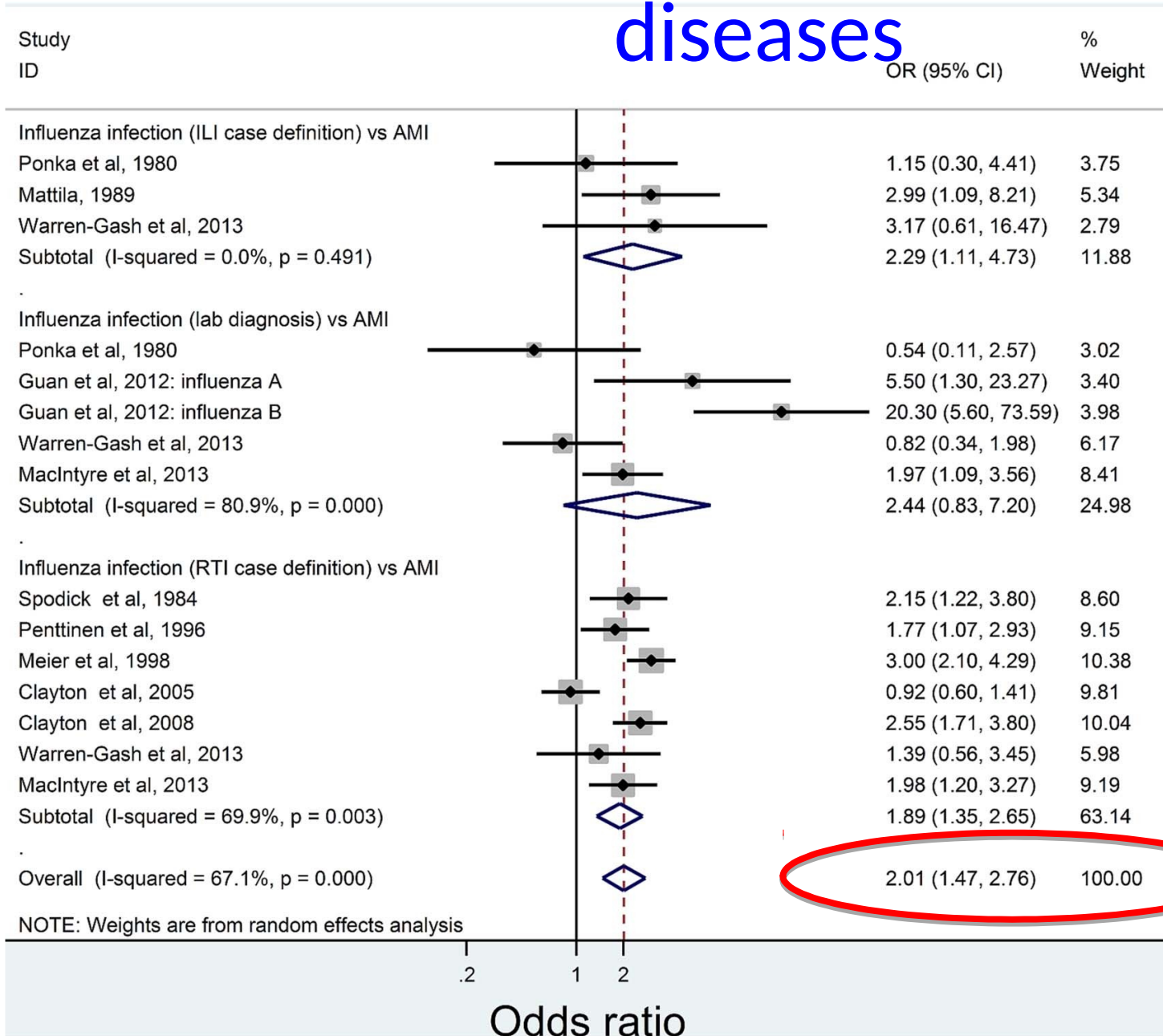
Same agency ? French Public Health ?

Is it really serious ?

but it is everywhere...

Real flu associated death is not known

# Indirect Impact of flu on cardiac diseases

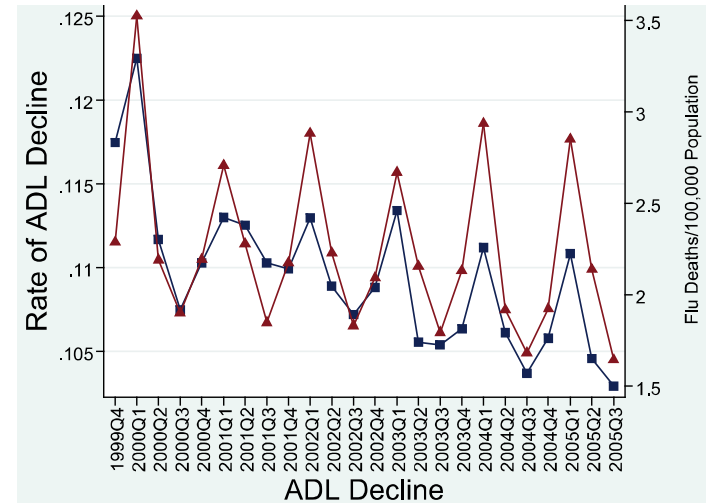


# Influenza associated disability

**Table 4. Case and Comparison Subjects Experiencing Worsening in  $\geq 1$  Functions From Before Outbreak (Baseline) and 3 to 4 Months After Outbreak\***

No. of Worsening Functions	Case Subjects (n = 116)	Comparison Subjects (n = 127)
0	87	107
1	16	15
2	7	4
3	2	0
$\geq 4$	4	1
	29 (25.0%)	20 (15.7%)

William H. Barker Arch Intern Med 1998



Gozalo PL JAGS 2013

Flu Increasing Disability ( impact on ADL)

French recent data (126 Flu lab confirmed)

35% did not reverse flu acquired disability

# Influenza Vaccines : Efficiency

Young adult 18-64 y

Decrease ILI	-16%	(5-25%)
Virologically Confirmed flu	-60%	(34.8-93.3%)

Esposito S Human Vac Immun 2016

Elderly:

**Meta analysis (ss) : Efficiency of** inactivated influenza vaccine

Letal and on letal Complications, - 30 %

Reduced ILI onset - 40 %

Virologically Confirmed flu - 50 %

Respiratory causes (pneumonia, COPD exacerbation)

**Cardiovascular causes (strokes and Myocardial Infarction)**

Beyer WE, Vaccine 2013

# Influenza vaccine– Adverse drug reaction

Fewer and less severe / young adult

***Vaccine vs Placebo*** Etude la plus récente

**General signs** No differences

**Local ADR** 11.3% Vaccine 5.1% Placebo

# European consensus on Influenza vaccination

Yearly influenza vaccination adult and particularly vulnerable Individuals > 65 Y old

Standard-dose inactivated influenza vaccine (trivalent or **quadrivalent**)

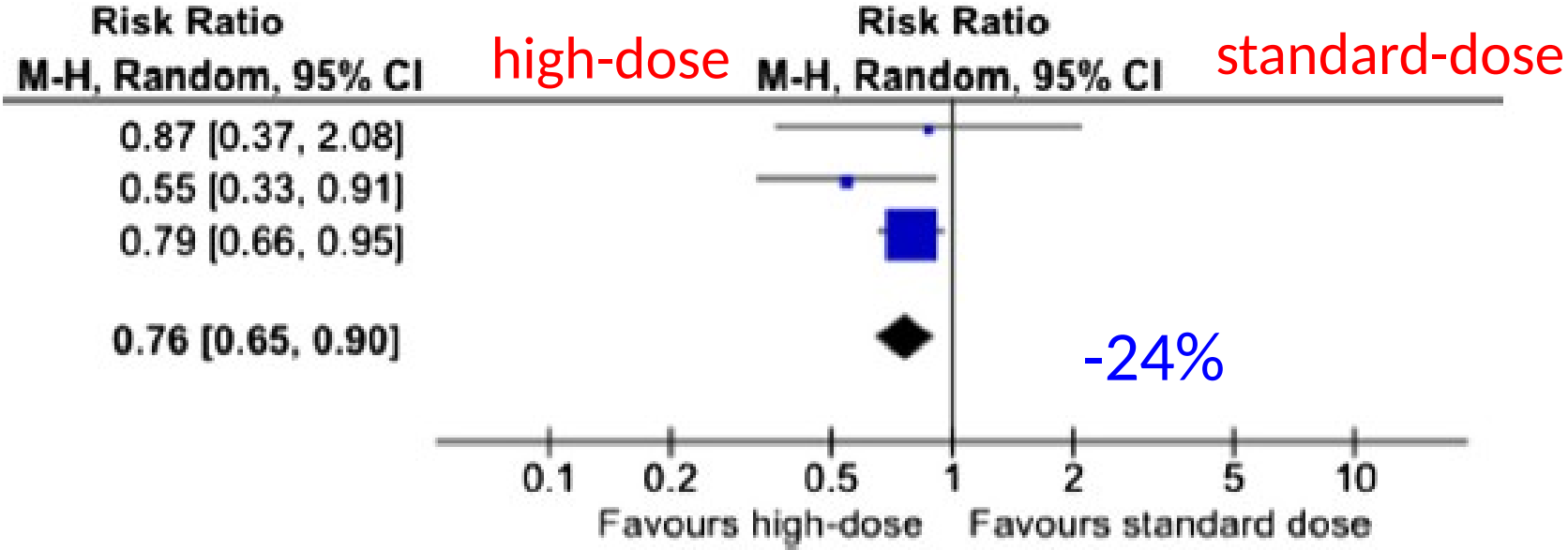
Alternatively, the **high-dose inactivated influenza vaccine or adjuvanted influenza vaccine (> 65+)**

# Efficacy and safety of high-dose influenza vaccine in elderly adults: A systematic review and meta-analysis

Krista Wilkinson<sup>a,b,\*</sup>, Yichun Wei<sup>b</sup>, Andrea Sz wajcer<sup>c</sup>, Rasheda Rabbani<sup>a,d</sup>, Ryan Zarychanski<sup>a,d,e,f</sup>,  
Ahmed M. Abou-Setta<sup>a,d</sup>, Salaheddin M. Mahmud<sup>a,d</sup>

Vaccine 2017

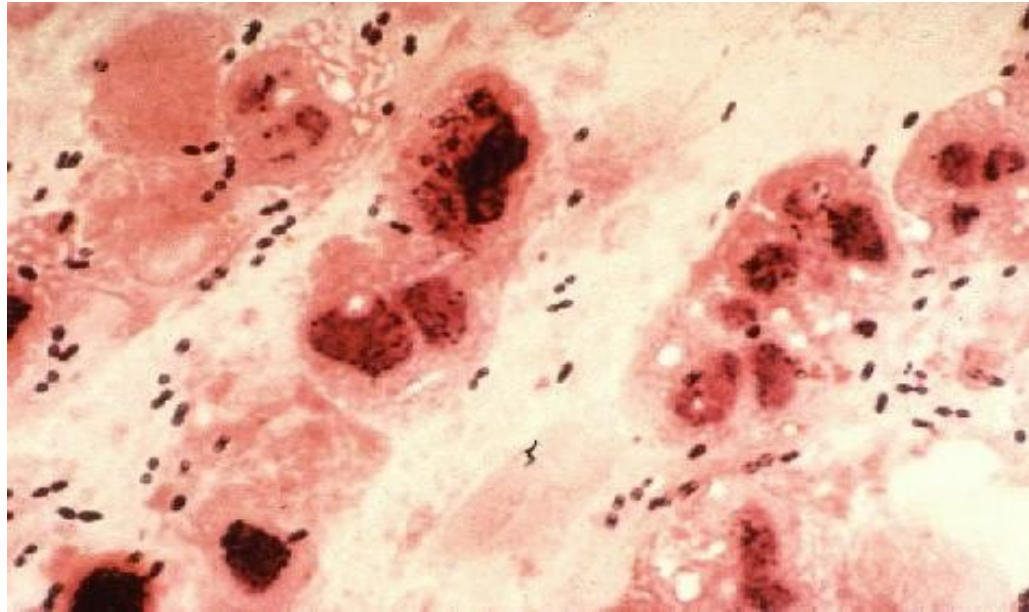
## Laboratory-confirmed influenza infection in patients randomized



High dose..... meilleur que Standard dose Sur ILI?  
Efficacité sur survie et Hospitalisation lié à la grippe ??



# *Pneumococcus*



# Pneumonia in older : is it frequent ?

soit 1.000 à 5.000/100.000

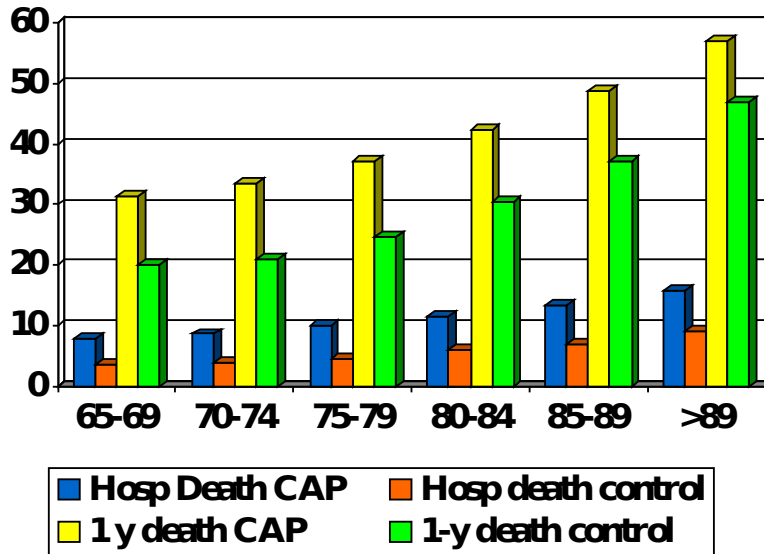


Prevalence	>65 y	>80 y
Community acquired Pneumonia	1‰	10‰
Health care associated Pneumonia	1%	à 5%
Pneumonie en Nursing Home	1%	à 4,6%

incidence 0.3- 2/1000RJ

**France: Annual Incidence en Nursing home : 21%**

# Impact = Death and Disability



## Short and long term mortality

### Mortality rates

-Community /Nursing home

D30 : 7,2 vs 26,6 %

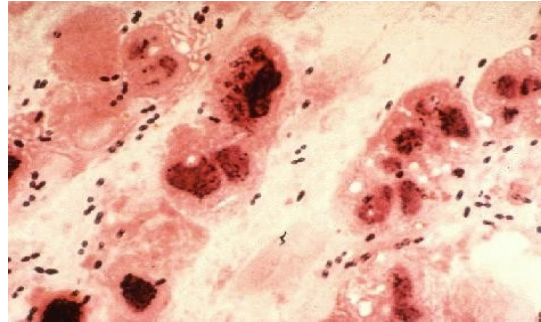
1 year : 14,6% vs 43,8%

	CAP		NHAP	
n	99	781	1070	
Functional Decline	23%	28,8%	31,1%	
Assessment date	D15	D30-90	D180	
Risk factors	PSI	Multiples		

### Disability ( ADL)

$\frac{1}{4}$  to  $\frac{1}{3}$

# Pneumococcal vaccination Overview



## Vaccine

PPV23

PCV13

low antibody response

□□

No T cellular memory

++

No mucosal response

+

Very good tolerance

OK

PPV23 decreases the immunological response to PCV13

# Does PPV23 prevent PD or deaths in adults

Cochrane 2013 review PPV23/ NH RCT

Included **18 RCTs** (n=64,852) and **7 non-RCTs** (for IPD only; n=62,294)

- **Meta-analysis:**

- Prevention of IPD: **OR 0.26** [0.14; 0.45]

- **Prevention of all cause pneumonia**

- in low income countries, general population: **OR 0.54** [0.43; 0.67]\*
- In high income countries, general population: OR 0.71 [0.45; 1.12]
- High income countries, chronic illness: OR 0.93 [0.73; 1.19]

- **Prevention of all cause mortality**

- No effect: **OR 0.90** [0.74; 1.09]

- **Non-RCTs controlling for confounders,**

- culture confirmed IPD:** OR **0.48** [0.37; 0.61]

- **PREVENTION IN Nursing Home(IPD)**

- Prevention of IPD OR **0.63** [0.32; 0.87]
- Prevention of all cause pneumonia OR **0.44** [0.22; 0.68]

\*African goldminers (Austrian,1976; Smit 1977); AR 90 / 1,000 person years;;  
Community dwelling adults in highlands of Papua New Guinea (1977);

# Vaccine Coverage PPV23: Europe

19-69%  $\geq 65$  y/ 11-27% high risk group

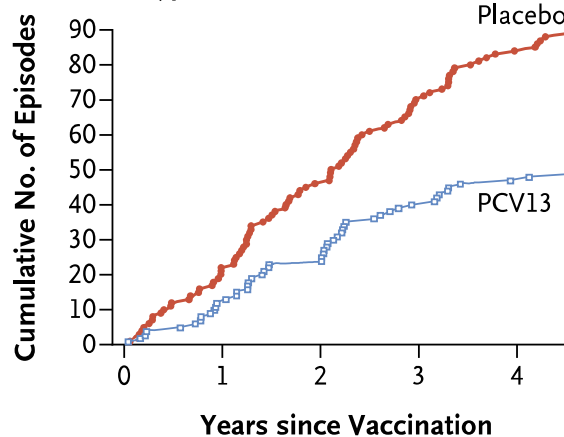
Study (year)	Country	Population	Study design/method	Annual VCR (%)	Cumulative VCR (%) <sup>§</sup>
Gavazzi <i>et al.</i> (2007)	France	Aged $\geq 65$ years <sup>†</sup>	Survey in geriatric healthcare facilities		21.9 (up to 2003)
Delelis-Fanien <i>et al.</i> (2009)	France	Aged $\geq 65$ years <sup>†</sup>	2-month survey of GPs		19.6 (up to 2007)
Tiv <i>et al.</i> (2010)	France (two regions)	High-risk adults aged $\geq 65$ years in nursing homes	Survey in geriatric nursing homes		27 (up to 2009)
Spindler <i>et al.</i> (2008)	Sweden (Stockholm County)	Aged $\geq 65$ years	National registration number (active campaign flu vaccine + PPV23)		36 (end 1998 to end 2001)
Martinelli <i>et al.</i> (2010)	Italy (Puglia region)	Aged $\geq 65$ years	Data from local health unit vaccination registers + GP validation	$\leq 8$ (2005–2007)	26.3 (2000–2004) 31 (2002–2007)
Zhang <i>et al.</i> (2007); Begum <i>et al.</i> (2008)	UK (HPA surveys 2006/07 and 2007/08)	Aged $\geq 65$ years	National survey among GPs	6.5 (2006/07) 4.6 (2007/08)	66.6 (2003–2007) 69 (2003–2008)
Bossuyt <i>et al.</i> (2005)	Belgium	Aged $\geq 60$ years <sup>†</sup>	Data collected via GP sentinel network		29 (1993–2004)
Tafforeau <i>et al.</i> (2008)	Belgium	High-risk adults (aged $> 50$ years) <sup>†</sup> and $\geq 65$ years <sup>†</sup>	Population-based survey		11 (2003–2008)
Dominguez <i>et al.</i> (2005)	Spain (Catalonia)	Hospitalized patients aged $\geq 65$ years	Case–control (effectiveness) study		21% in IPD cases 41% in controls (October 1999 to March 2002)
Vila-Corcoles <i>et al.</i> (2006)	Spain (Tarragona, Catalonia)	Aged $\geq 65$ years	Prospective cohort (effectiveness) study		44% (October 1999 to end 2001; i.e., before start of study)
Mereckiene <i>et al.</i> (2010)	Ireland	High-risk adults aged $\geq 65$ years	Phone survey among population		12 (up to 2009/10) 33 (up to 2009/10)

## PCV13 in senior >65 y

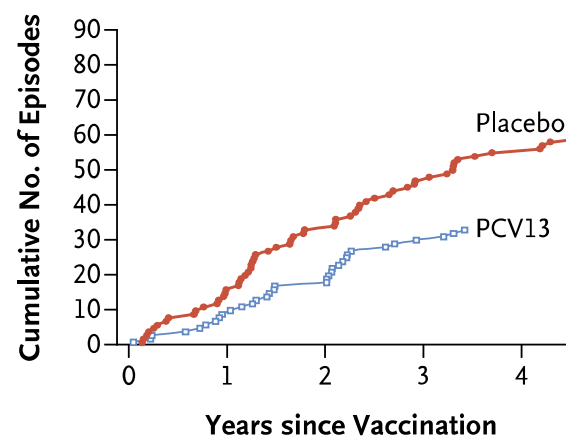
- **45.00%** (95.2% CI 14.21%-65.31%; p=0.0067) for preventing first episode nonbacteremic and noninvasive pneumococcal community-acquired pneumonia
- **75.00%** (95% CI 41.43%-90.78%; p=0.0005) for preventing VT invasive pneumococcal disease.

- Durability of vaccine efficacy through 4 years of follow up

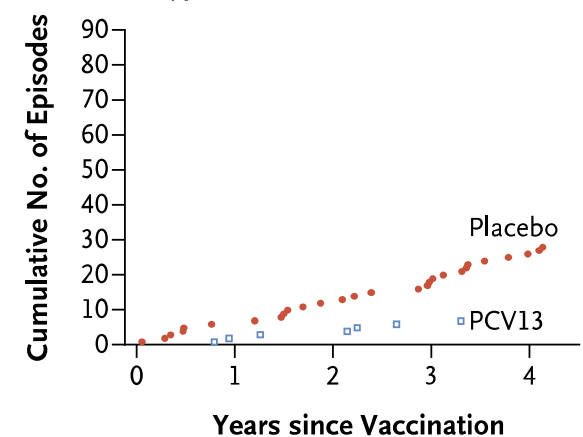
**A** Vaccine-Type CAP



**B** NB and NI CAP



**C** Vaccine-Type IPD



- Very few side effects

# Consensus on Pneumococcus vaccination

(ESCMID/EUGMS/WAIDID)

## Senior strategy :

### - PCV13 and before giving PPV23 after 1 year

-In cases of previous PPV23 vaccination,

a new vaccination with PCV13 at least 12 months after the PPV23 vaccination

- PPV23 or PCV13 may be co-administered with the influenza vaccine.

- Use of PPV23 together with or before PCV13 : **not recommended**.

### - If PCV13 is unavailable:

PPV23 for any patients aged 75 years or older

Risk-based strategy for population between 65 and 75 years .

## Adult strategy <65 y

Risk-based strategy / or individual proposition



# Question for Pneumococcus vaccination

Senior strategy :

Does it works everywhere.... ?

Evolution of Pneumococcal serotypes according countries and strategies for PCV 7, 10 or 13 vaccine in children?

Is it still the time to... adopt the strategy

Ex: STIKO (Germany) decided to pursue PPV23

CTV (France) a Risk-based strategy

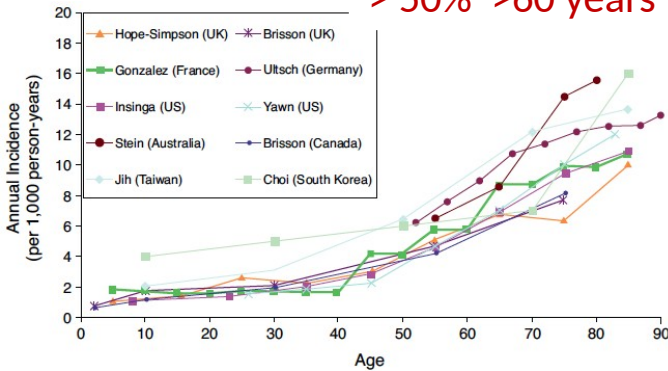
# Zoster



# Zoster : does it Harm ?

Greater pain burden, associated with poorer physical functioning, increased emotional distress, and decreased role and social functioning

> 50% >60 years



## Physical impact

Chronic fatigue  
Anorexia  
Weight loss,  
Physical inactivity  
Insomnia

1 out of 4/5 individual  
will experiment  
Zoster over his life

## Psychological impact

Depression  
Anxiety  
Difficulty concentrating

**HZ-related pain**  
The magnitude of suffering is  
directly related to pain intensity  
& duration

## Functional impact

Interfere with basic and  
instrumental activities of  
daily living:  
- Dressing, bathing,  
eating, mobility,  
- Travelling, cooking,  
housework, shopping

## Social impact

Decreased social  
gatherings  
Change in social role

# Zoster Live attenuated Vaccine

## Only available

- **Same than varicellea Vaccine for children**
  - Higher dosage 14 fold
- **Contra-indication if immunodeficiency**
- **No control before immunization**

## Adverse drug reaction :

- Redness, itching, swelling, warmth, and pain at the injection site
- **Local pain in extremity**
- **Chicken pox : < 1 / 10 000**

# Age-related efficacy response to VZV vaccine

**Efficacy of zoster vaccine. HZ indicates herpes zoster; PHN indicates postherpetic neuralgia. Data for these outcomes were adapted from reference [25\*\*]. 'Preserving activity' indicates maintenance of activities of daily living.**

Clinical endpoint	Efficacy (%)			
	All ages (years)	60–69	70–79	≥80
HZ	51	64	41	18
PHN	67	66	74	42
Preserving activity*	66	70	61	59

Real decrease efficacy to reduce shingles incidence after 80 years old . Still a large efficacy regarding, PHN and impact on activity

Equivalent efficiency in real life studies

Equivalent efficiency in patient with comorbidities

# Consensus Herpes Zoster vaccination

(ESCMID/EUGMS/WAIDID)

For individuals **aged 50 years** and older, including in patients with previous zoster episodes.

NO revaccination, currently

Contra-indications :

previous anaphylactic reactions pregnancy, and primary cellular or acquired immunodeficiency.

Waiting for a new Conjugate vaccine ( ZOE 50/ZOE70)

Availability in 2020 ???

# Herpes Zoster vaccination uptake : EU examples

France : Recommendations > 65-74 no strategy (2016)

Uptake < 1%

UK : Recommendation and a strategy for > 70 y (2014)

61.8% in 2013/14

But ...48.3% in 2016/17 : 13.5% decline

Still different National recommendations at EU level

# THOM n°1 Consensus on vaccine

Diphtheria/ Tetanos

All > 65y / 10 Year

Influenza

All a each year

Pneumococcus

PCV13 and PP23V > 65 y

high risk < 65y

Zoster

All > 50 y once

Others see in

human **V**ACCINES  
& IMMUNOTHERAPEUTICS

Volume 11 • Issue 9 • September 2015

Editor-in-Chief  
Ronald Ellis  
Forteo Ltd  
Nes Ziona, Israel



# THOM vaccine recommendations

However still

Not enough efficacy for major VPD

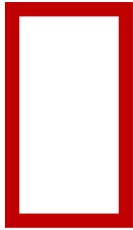
Too Low vaccine coverages

Nosocomial transmissions  
(For flu)

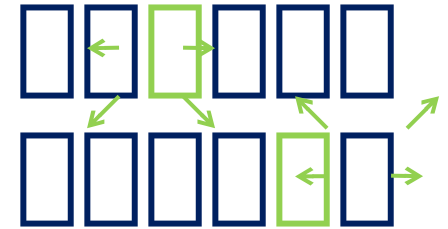
After 50 y once

# Question for getting an HERD PROTECTION

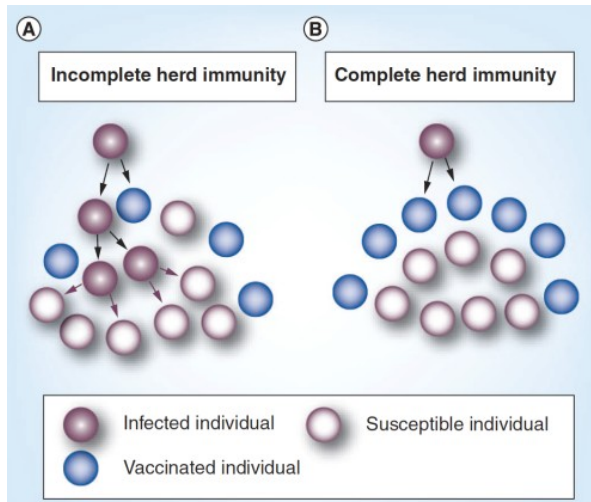
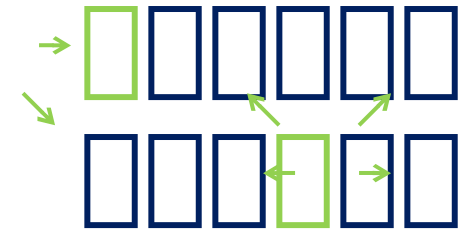
For micro organism with person to person transmission / human reservoir



**BENEFICIAL EFFECTS OF VACCINATING**  
are not limited to people who get the vaccine.



**GREATER EFFECTS** on close contacts, neighbours and at the community level are also measured.



according disease transmission rate, /  
Impacts and threshold of vaccinal coverages will be different  
person to person transmission / human reservoir

# Getting an Herd immunity

## Exemple : Influenza vaccination of HEALTH CARE WORKERS

All cause Mortality among Nursing home residents : 3 Clustered RCT

<b>Institutions</b>	<b>10</b>	<b>10</b>	<b>23</b>	<b>23</b>	<b>20</b>	<b>20</b>
<b>Nb residents</b>	<b>749</b>	<b>688</b>	<b>1249</b>	<b>1323</b>	<b>1722</b>	<b>1678</b>
<b>Vaccination HCW</b>	<b>49.8</b>	<b>4.8</b>	<b>35.4</b>	<b>5</b>	<b>69.9</b>	<b>31.8</b>
<b>resident Mortality</b>	<b>13.6</b>	<b>22.4*</b>	<b>11</b>	<b>15.3*</b>	<b>5.2</b>	<b>6*</b>

Carman WF Lancet 2000,

Hayward AC BMJ 2007

Lemaître M JAGS 2009

\* P<0.05

Influenza vaccination of HCW :  
 Mortality among Nursing home residents  
 3 Clustered RCT

Clear efficiency of HCW vaccination to  
 reduce  
 all cause mortality in older population  
 But general coverages < 30%  
 In Europe  
 ???

Institutions	10	10	13	23	20	20
Nb residents	749	688	1249	1323	1722	1678
Vaccination HCW	49.8	4.8	35.4	5	69.9	31.8
resident Mortality	13.6	22.4*	11	15.3	5.2	6

Carman WF Lancet 2000,

Hayward AC BMJ 2007

Lemaître M JAGS 2009

# Is there any problem for flu HCW vaccination : HCW In USA?

SA.... 2013 / 2014  
Flu season

	No. in sample	Weighted % <sup>†</sup>	Weighted % vaccinated
<b>Influenza vaccination</b>			
<b>Required</b>	738	35.5	97.8
Hospital	520	58.2	97.7
Ambulatory care/ Physician office <sup>§</sup>	252	33.6	96.4
Long-term care	88	20.1	98.4
Other clinical setting**	88	29.3	99.5

Centers for Disease Control and Prevention

**MMWR**

Weekly / Vol. 63 / No. 37

Black CL et al

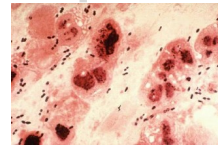
Morbidity and Mortality Weekly Report

September 19, 2014



# Summary

- What is « healthy ageing » / Active ?
- Scientific evidence of ID (VPD) impact on ageing - role of vaccine to prevent ?



VPD  
Pneumococcus  
Influenza  
Zoster



- Vaccine Policies , evidences?



Overview

# European vaccination Guidance for older adult (ESCMID/EUGMS/WAIDID)

Dt Pertussis vaccine >65 y (Pertussis according outbreak)

Flu vaccine >65 y

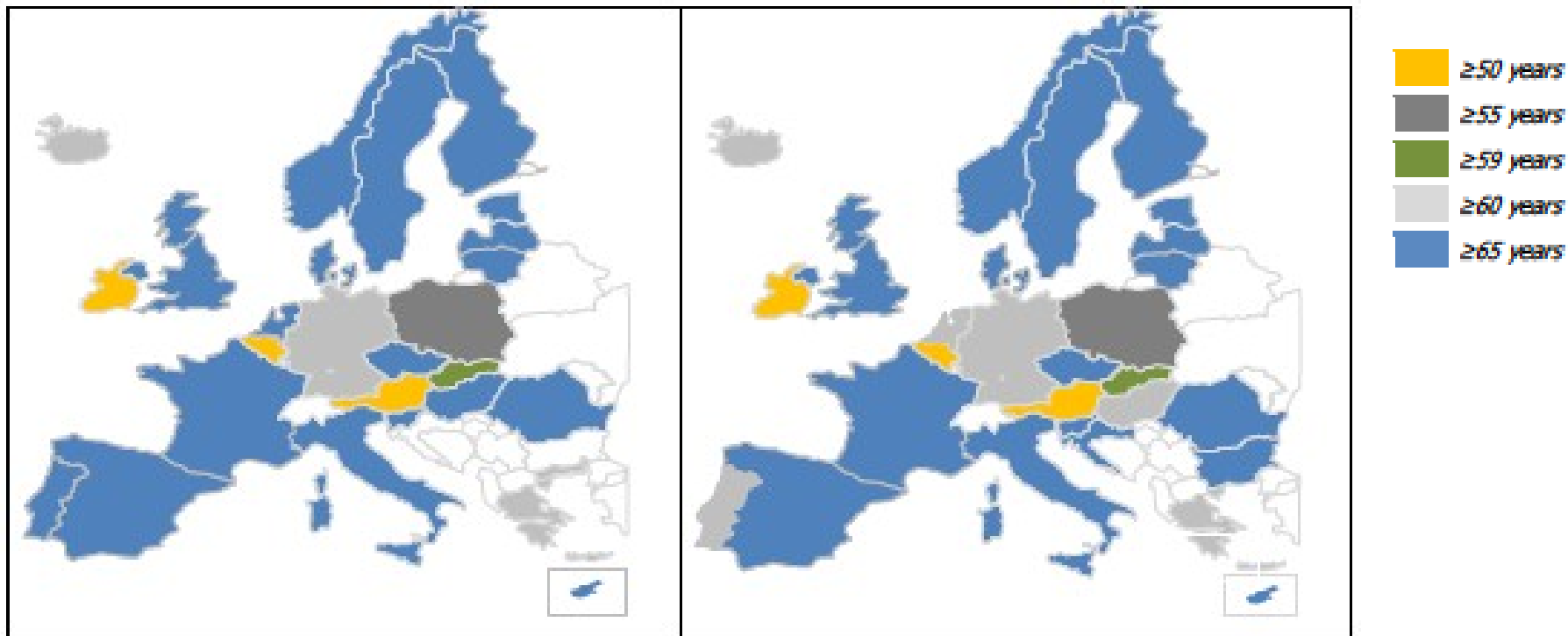
PCV13 and before giving PPV23 after 1 year >65 y

HZV vaccine All > 50 y

But

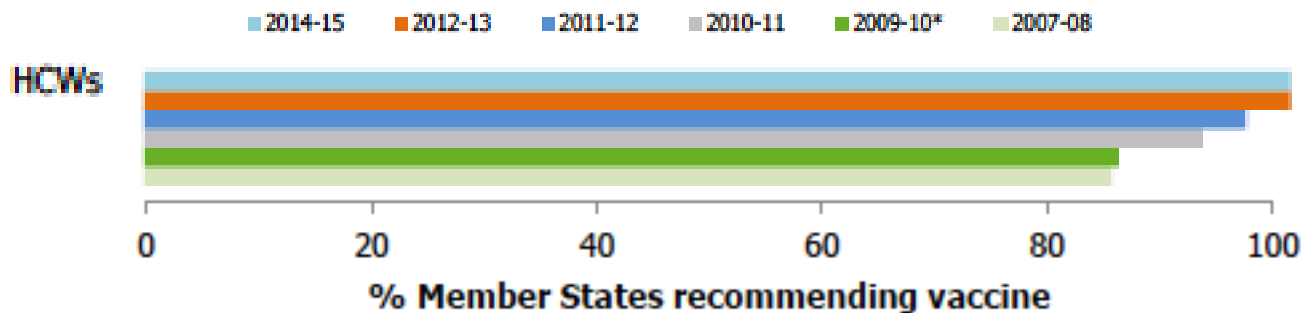
Very different recommendations in EU member states

# Vaccine Policies , Evidences for flu ?



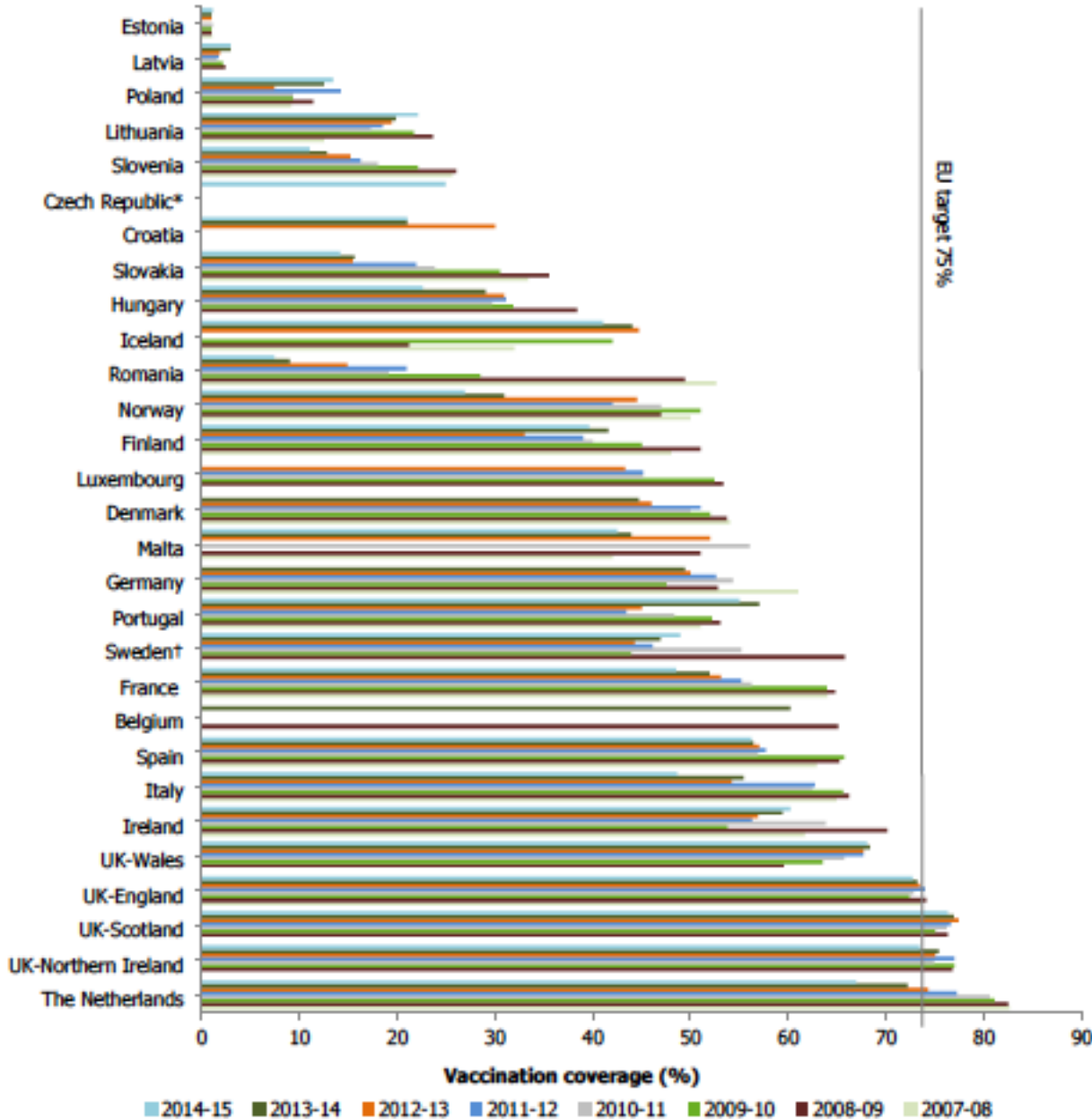
Source: National seasonal influenza vaccination survey, December 2015 and July 2009

## Flu European recommandations / nation from 2008 to 2014





# Flu Vaccine coverage EU ( 2008-2015)



Dramatic  
decreases  
Everywhere...

...

Out of UK





# The impact of European vaccination policies on seasonal influenza vaccination coverage rates in the elderly

Patricia R. Blank<sup>1,2,\*</sup> Matthias Schwenkglenks<sup>1,2</sup> and Thomas D. Szucs<sup>1</sup>

## Stand alone policy element:

Variable	Parameter Estimate	Pr >  t
Monitoring VCR (By HA and/or NVIG)	0.194	0.111
Patients receive personal letter/voucher for free flu vaccine	0.131	0.050
National objectives	0.195	0.096
National objectives adopted for risk-groups	-0.122	0.420
90–100% reimbursement of vaccine	0.201	0.105

## Best = association of several reommandations :

	Objectives	Monitoring	Incentive	Reimbursement	Letter /voucher	Flyers
Objectives AND monitoring			0.607	0.631	0.607	0.558
Incentive AND reimbursement	0.734	0.734			0.721	
Letter /voucher AND reimbursement						0.820

The impact of European vaccination policies  
on ser

However,

the best association in  
France and

flu vaccine coverages  
decrease

Be

yers

Objectiv  
monit

Incenti  
reimbui

Letter /  
Al  
reimbui

558

820

# European Pertussis vaccine Older



- Austria All  $\geq 60$  Y<sup>6</sup>



- Belgium (Flemish area) Unique dose for all adults<sup>7</sup>



- Germany Booster every 10 years de dT for adult, Tcoq<sup>8</sup>



- Liechtenstein Booster at 65 y , then each 10 y<sup>9</sup>



- Luxembourg Booster every 10 years ans<sup>10</sup>

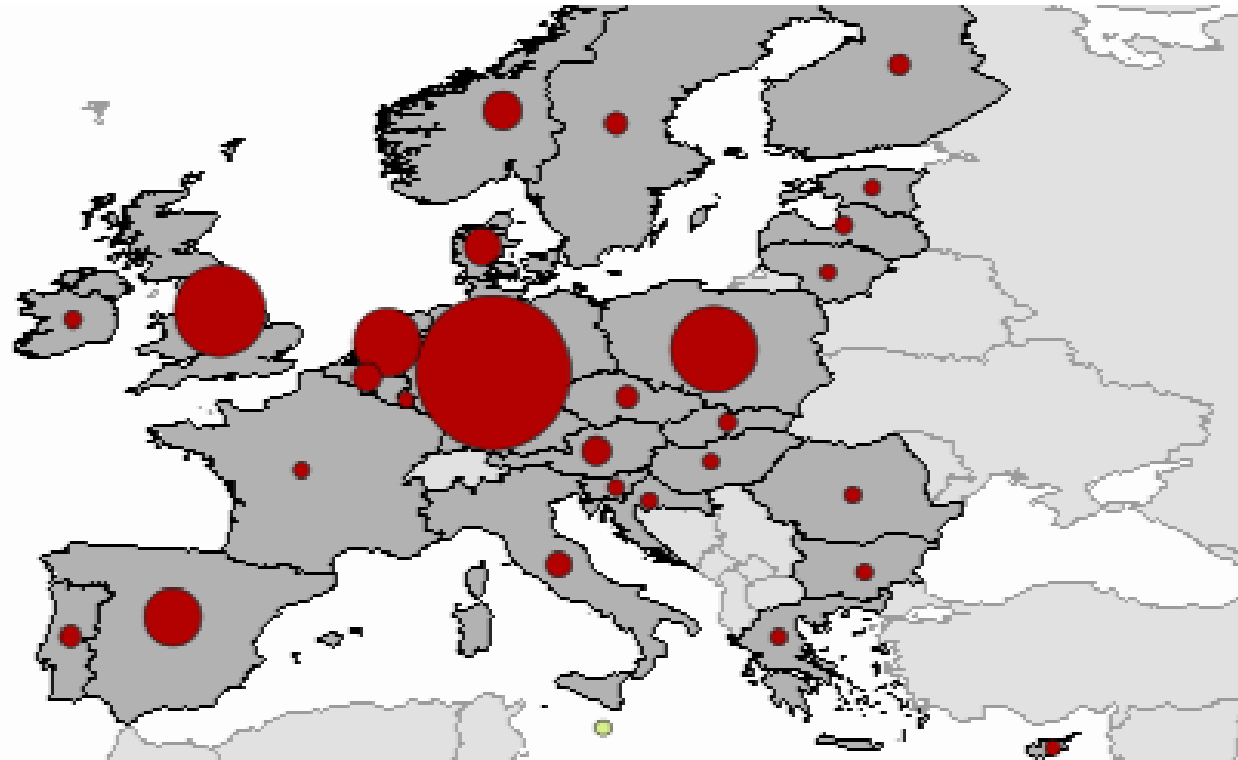
# European Pertussis epidemiology

## Older

No national recommendation	Bulgaria, Canada, Croatia, Cyprus, Denmark, Estonia, Finland, Hungary, Iceland, Ireland, Latvia, Lithuania, Japan, Republic of Korea, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, United Kingdom
Single booster in adulthood	Belgium, Czech Republic (at age 65), France, Germany, Greece, Slovenia, United States
Adult, every 10 years	Austria <sup>a</sup> , Italy, Luxembourg
65+, every 10 years	Lichtenstein <sup>b</sup>

High variability :

Est ce réellement  
fonction des épidémiologies



# Take Home Messages 3

ID (VPD) decreases dramatically “Healthy Ageing”

Vaccines decreases direct and indirect short /long term mortality associated with VPD in ageing population

Zoster vaccine only prove an impact to prevent Disability associated Zoster.



# Take Home Messages 4

Variable policies or Enough Policies ?

Heterogeneity of Policies drive to No Policies

Main recommendations to improve VC are known

**Need for Strong Political willingness**

To put together...all stakeholders...

Risk/benefit / Surveillance / Feed back

Media

# Thank you for your Attention

Belledone , France



“The good physician treats the disease;  
the great physician treats the patient who has  
the disease.”

William Osler

« **What's natural is the microbe.**  
**All it lasts- health, integrity,**  
**purity (if you like) - is a product**  
**of the human will, of a vigilance**  
**that must never falter ».**

in « the PLAGUE » Albert Camus