Health Burden of VPI in older adults – the Herpes zoster example (…for Italy)

Session 3: The epidemiology and health burden of selected adult VPIs • part 1

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Adult Immunization Board

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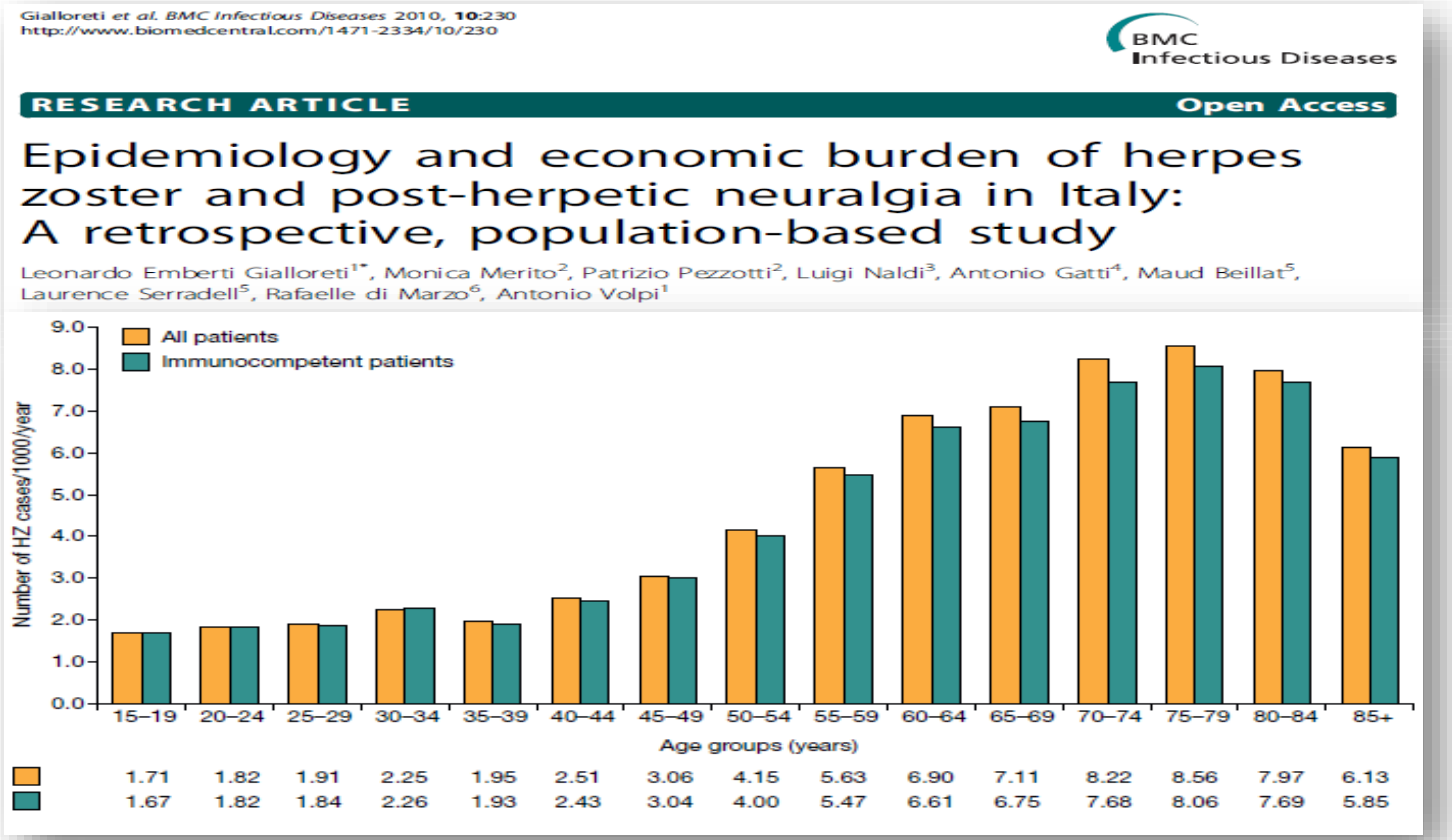
  - Incidence data
  - Hospitalization data
- HPV preventive strategies in (EU) and in Italy

HZ disease burden in Italy

WHAT ABOUT HZ INCIDENDE DATA AND QUALITY OF LIFE?

Epidemiology and health impact of Herpes Zoster and its complications in Italy

- **In 2010 Gialloreti et al.:**
  - **Estimated 157,100 new cases of HZ each year**
  - **Annual incidence of 6.3/1,000 person-years**
  - **88% of cases were immunocompetent**



Gialloreti *et al. BMC Infectious Diseases* 2010, **10**:230
http://www.biomedcentral.com/1471-2334/10/230

BMC Infectious Diseases

RESEARCH ARTICLE Open Access

Epidemiology and economic burden of herpes zoster and post-herpetic neuralgia in Italy: A retrospective, population-based study

Leonardo Emberti Gialloreti[1*], Monica Merito[2], Patrizio Pezzotti[2], Luigi Naldi[3], Antonio Gatti[4], Maud Beillat[5], Laurence Serradell[5], Rafaelle di Marzo[6], Antonio Volpi[1]

In 2010 in Italy there were approximately **22 million people** aged ≥50 years old

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Herpes Zoster: assessment of the health and socio-economic impact and possible vaccination strategies in the adult population in Italy funded by the Italian Ministry of Health (CCM 2013) – Main Objectives

- Estimate the **incidence of Herpes Zoster in subjects aged ≥ 50 years**
- Estimate the **frequency of complications**, especially Post-Herpetic Neuralgia PHN
- Describe the **characteristics of patients** with Herpes Zoster and the Herpes Zoster episode
- Describe **the diagnostic, therapeutic and care pathway**
- Estimate **the social and economic burden** for the NHS associated with the management of the patient with Herpes Zoster and PHN
- Describe the **perception of pain** and **the impact on quality of life**

4 Italian Regions involved in the CCM Project:

- Liguria (lead partner)
- Puglia
- Tuscany
- Veneto

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Centro Nazionale per la Prevenzione ed il Controllo delle Malattie

Alicino C et al. Hum Vaccin Immunother 2017: 2:399-404

Materials and Methods of the CCM Zoster Project

- Involvement of a **Network of General Practitioners** in the 4 Regions involved in the study (***about 100 GPs***)
- **Retrospective** and **prospective** identification of Herpes Zoster cases in subjects aged ≥ 50 years
- **Study Period**: January 2013 – December 2014 (later extended to December 2015)
- Data collected through a **questionnaire**

TARGETS:

COLLECTION OF ABOUT 560 QUESTIONNAIRES

400 RETROSPECTIVE AND 160 PROSPECTIVE

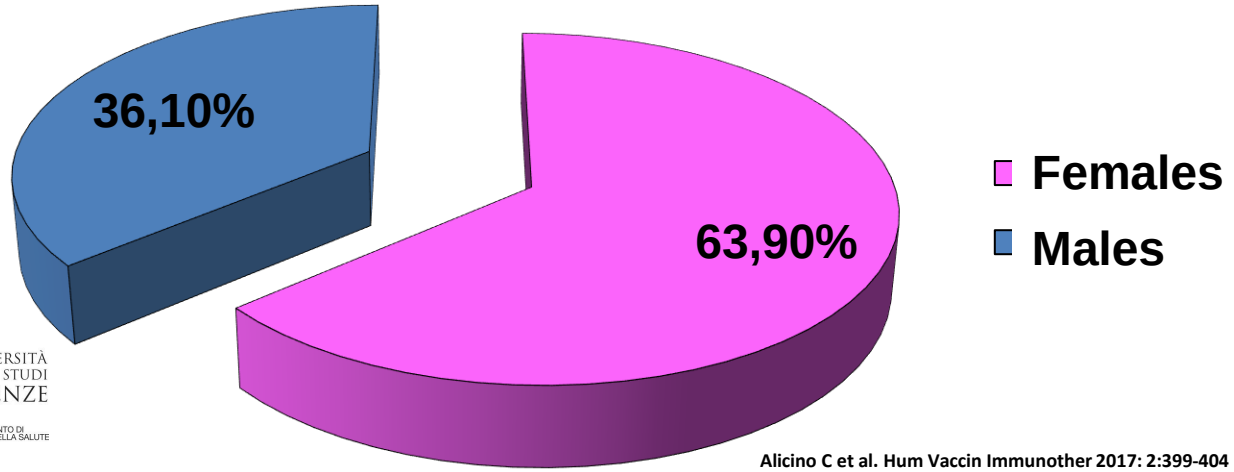
Alicino C et al. Hum Vaccin Immunother 2017: 2:399-404

Results of the CCM Italian Project

598 questionnaires collected from as many cases of **Herpes Zoster**

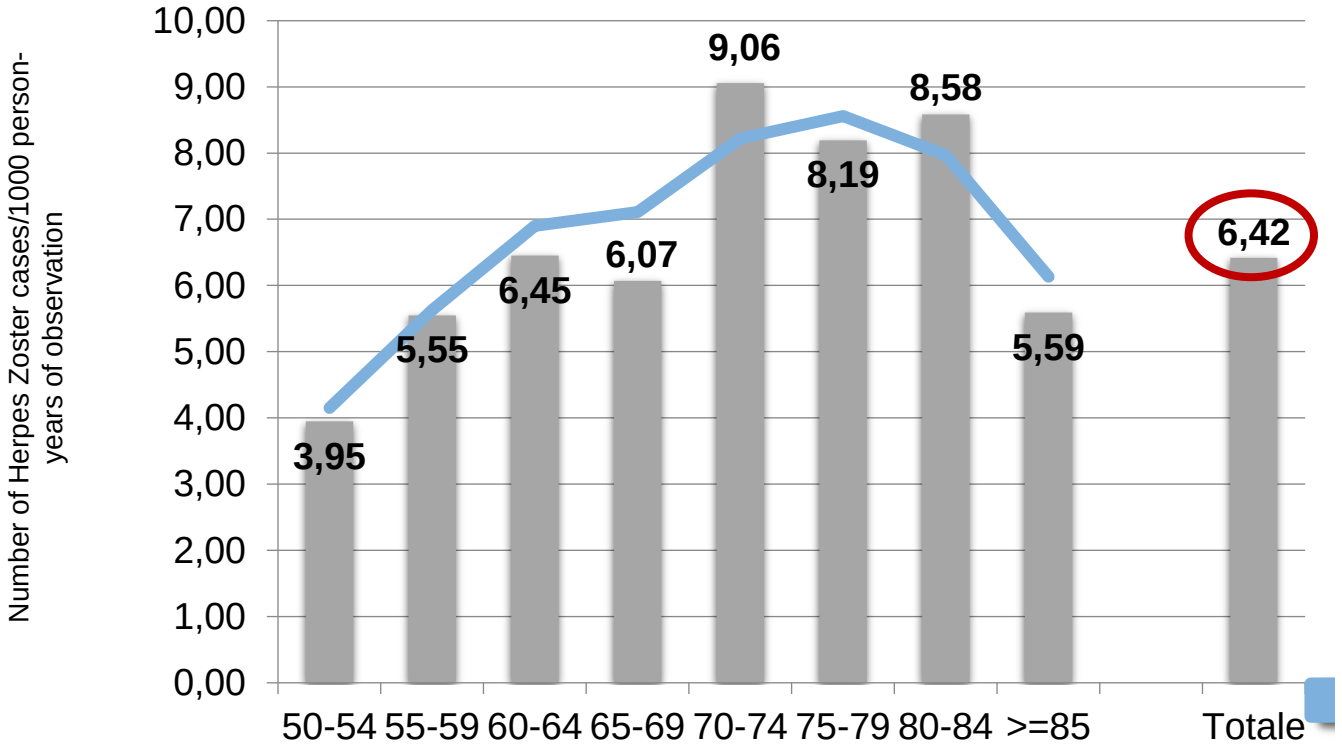
437 collected retrospectively (73.1%)

161 collected prospectively (26.9%)

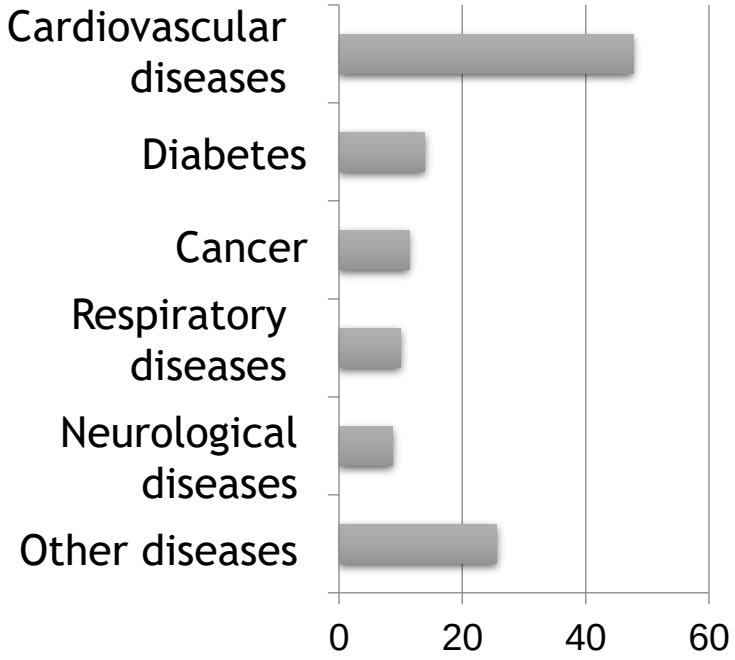


Alicino C et al. Hum Vaccin Immunother 2017: 2:399-404

Incidence of Herpes Zoster and associated comorbidities



449 patients had comorbidities (75.1%)



56 General practitioners (2013-2015 Liguria, Puglia, Toscana e Veneto)

- **Over 50 years of age: 598 cases of HZ identified over 93,146 person-years of observation**
- **Overall incidence: 6.42/1,000 person-years**

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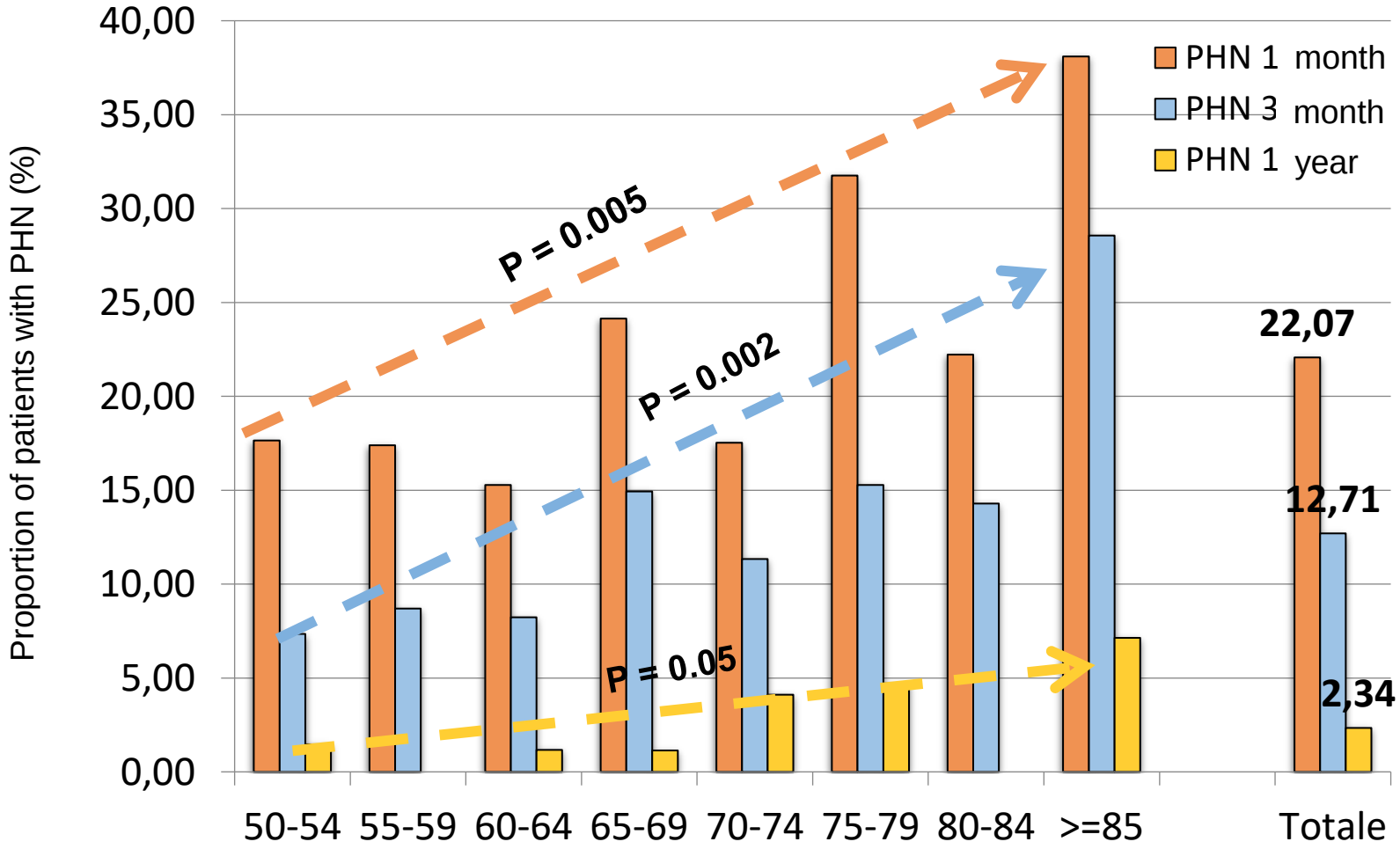
Alicino C et al. Hum Vaccin Immunother 2017: 2:399-404

Incidence of Herpes Zoster and associated PHN



PHN persists at 1 month, 3 months and 1 year, mainly in older subjects

The results in terms of incidence of the pathology and frequency of complications were in line with the national and international literature

The CCM Project provided an overview on the epidemiology of Herpes Zoster and its complications in Italy in outpatients

Alicino C et al. Hum Vaccin Immunother 2017: 2:399-404

HEROES STUDY

Bricout et al. BMC Infectious Diseases 2014, 14:637
http://www.biomedcentral.com/1471-2334/14/637

BMC Infectious Diseases

RESEARCH ARTICLE Open Access

Burden of herpes zoster-associated chronic pain in Italian patients aged 50 years and over (2009–2010): a GP-based prospective cohort study

Hélène Bricout[1*], Emilia Perinetti[2], Paolo Marchettini[3,9], Pietro Ragni[4], Carla Maria Zotti[5], Giovanni Gabutti[6], Antonio Volpi[7] and Elisabetta Franco[8]

Studio Heroes

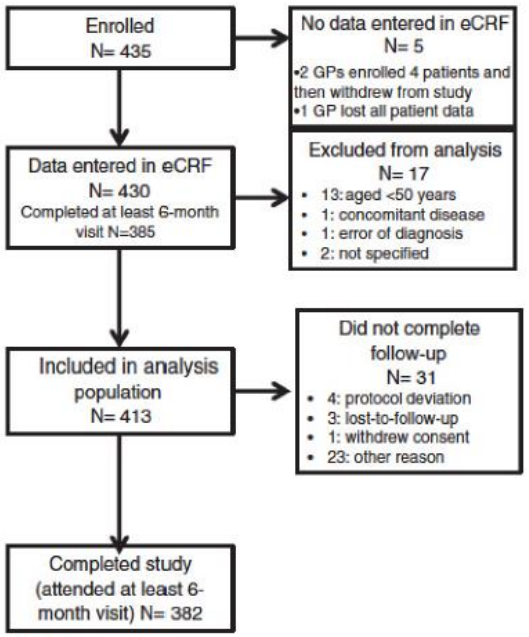


Figure 1 Disposition of included patients.

Methods: We performed a longitudinal, prospective study in 108 general practices throughout Italy to assess how many immunocompetent patients aged ≥50 years with newly diagnosed HZ develop HZ-associated pain, its duration and management over 6-months. HZ-associated pain was assessed by a direct question to the patient and by self-assessment of the worst pain felt in the previous two weeks on a visual analogue scale (VAS), a score ≥3 was taken as pain. PHN was defined as pain reported during the study period persisting for ≥3 months. Quality of life (QoL) was measured using the SF-12 questionnaire.

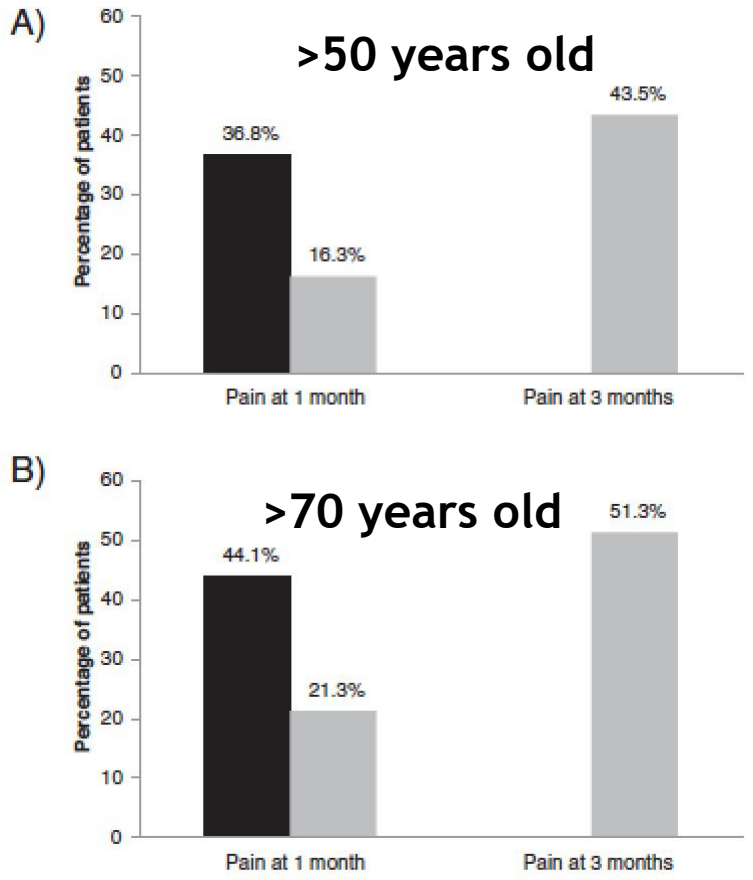


Figure 3 Percentage of patients with PHN (reported pain at the visit) at 3 (black bar) and 6 months (grey bar) among patients with pain at 1 month and 3 months. A: all patients aged ≥50; **B**: patients aged ≥ 70. 36.8% of patients aged ≥ 50 years and 44.1% of those aged ≥70 years with pain at 1 month had persistent pain at 3 months. 43.5% of patients aged ≥50 years and 51.3% of those aged ≥70 years with persistent pain at 3 months still had pain present at 6 months.

- **Despite early antiviral treatment** (within 72 hours of rash onset) 20.6% and 9.2% of patients >50 years with HZ **had PHN at 3 and 6 months**, respectively,.
- **HZ/PHN** impacts on the **quality of life**

IMPACT OF HERPES-ZOSTER RELATED PAIN AND COMPLICATIONS IN PATIENTS SUFFERING OF UNDERLYING CONDITIONS IN ITALY

L. Torcel-Pagnon[1], H. Bricout[1], I. Bertrand[1], E. Perinetti[2], G. Gabutti[3], A Volpi[4], E. Franco[5]

Figure 2: Age-adjusted pain intensity (VAS score) by group over time

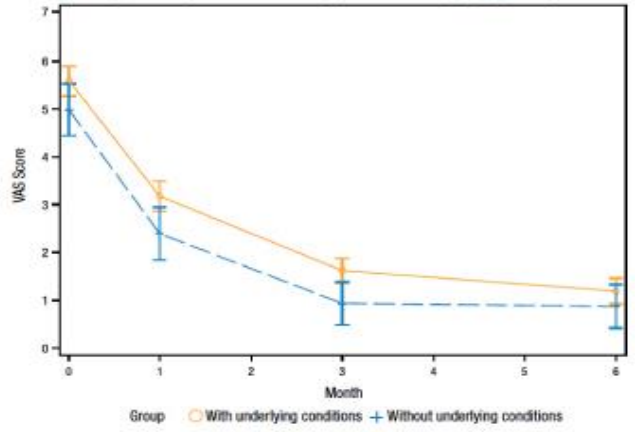


Figure 3: Age-adjusted physical health score (SF-12) by group over time

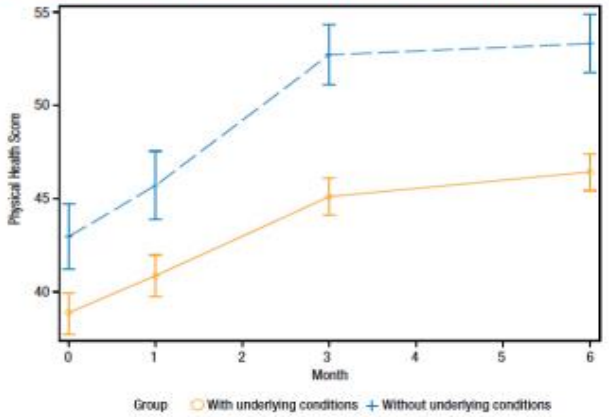
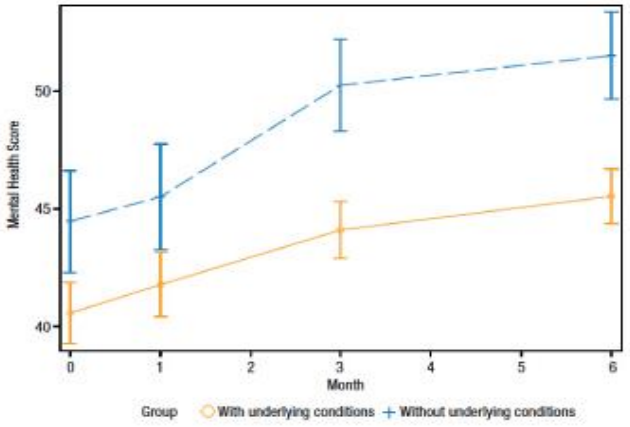


Figure 4: Age-adjusted mental health score (SF-12) by group over time



CONCLUSIONS

- HZ in patients with underlying conditions (cardiovascular, respiratory chronic diseases, diabetes and other relevant diseases) results in more painful and impactful episodes with an higher interference on patients' quality of life and slower recovery.
- With 80% of people aged over 65 years suffering from at least one chronic disease in Europe, prevention of HZ/PHN in elderly may contribute to maintain their quality of life and thus healthy ageing.

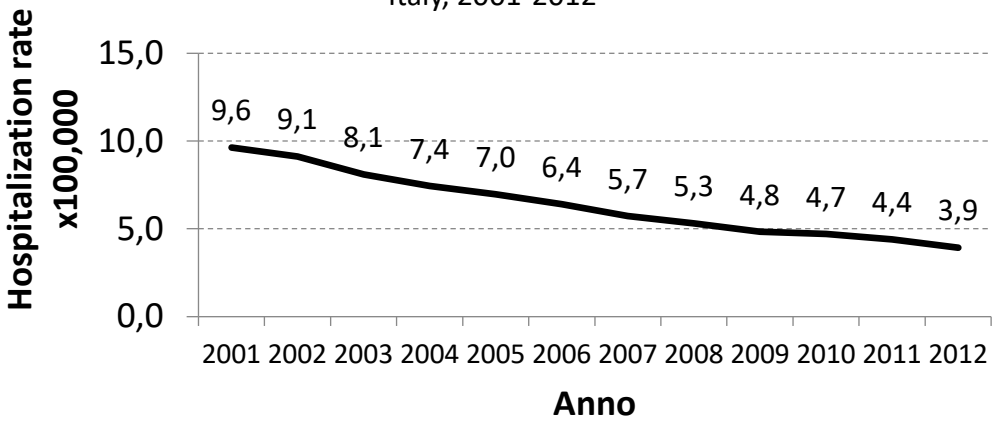
WHAT ABOUT HOSPITALIZATIONS IN ITALY?

- **HZ-related hospitalization is an indicator which expresses the most serious cases.**

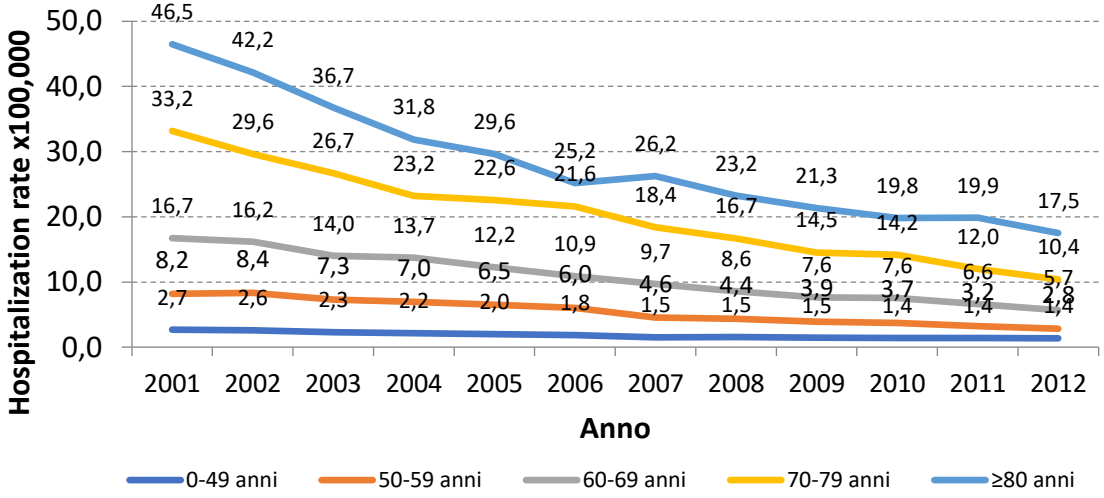
Centro Nazionale per la Prevenzione ed il Controllo delle Malattie

HZ-hospitalizations in Italy

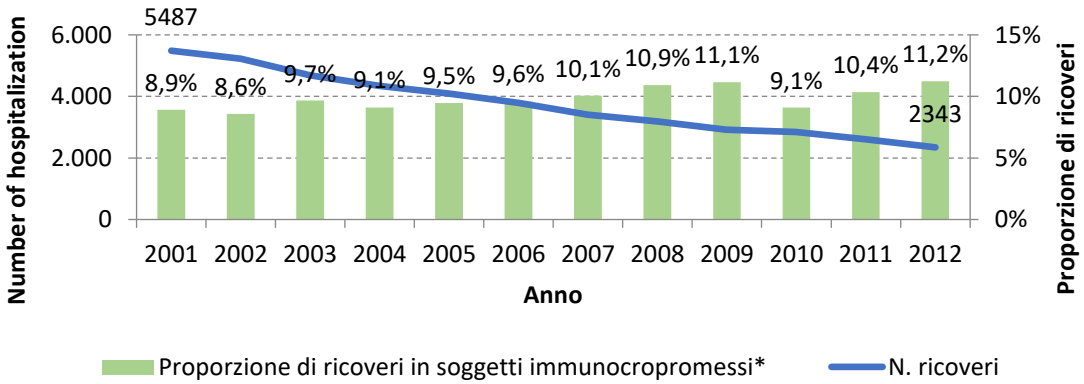
HZ hospitalization rate
Italy, 2001-2012



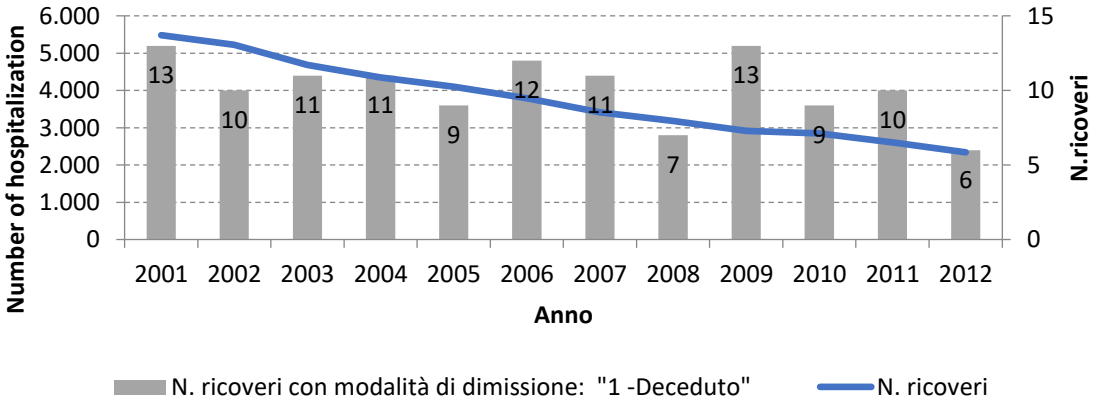
Hospitalization rate by HZ, by age Italy, 2001-2012



No. of hospitalizations for HZ and proportion of hospitalizations for HZ in immunocompromised subjects*
Italy, 2001-2012



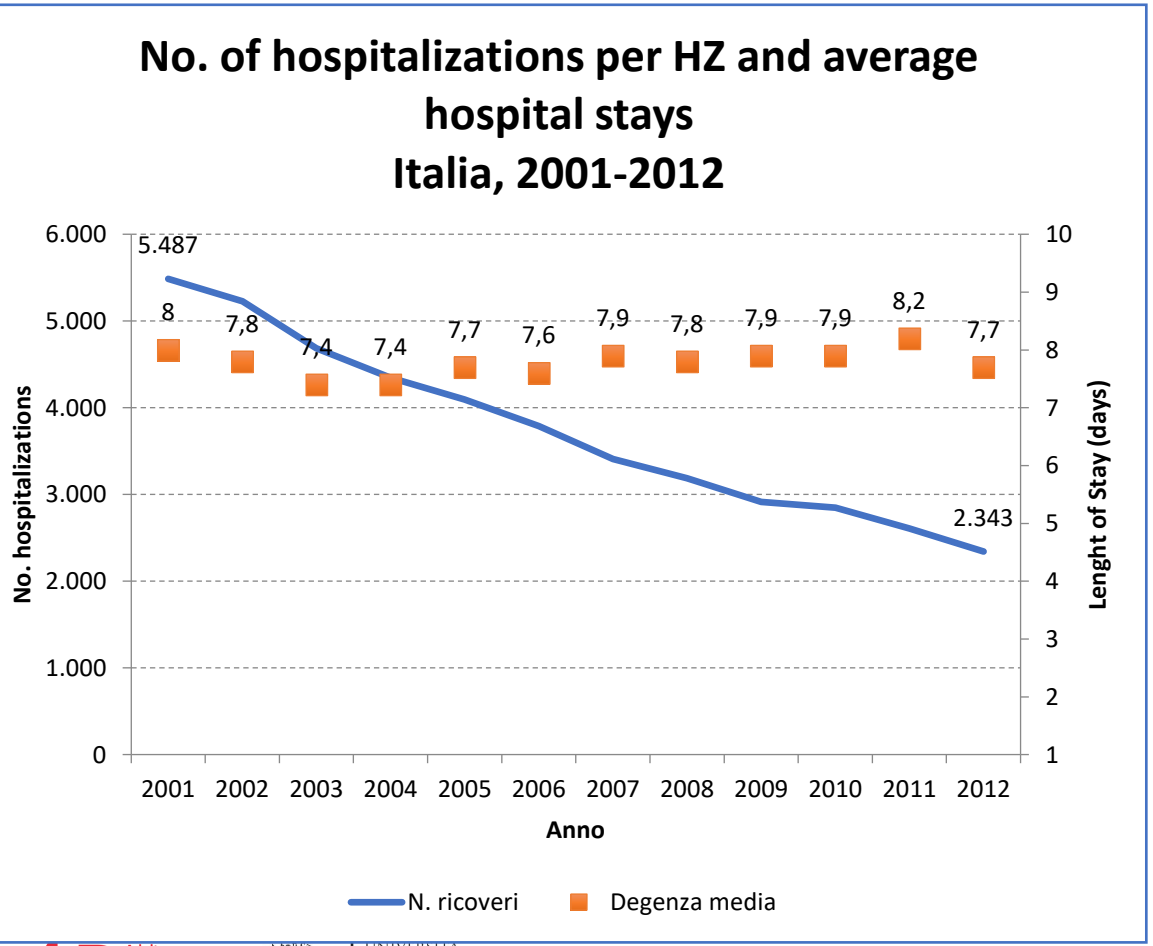
N. of hospitalizations for HZ and N. of hospitalizations for HZ with discharge as "deceased" Italy, 2001-2012



* Affetti da **tumore**, **HIV+** e **altre immunodeficienze**, **trapiantati** di **organo solido** e **midollo** [Gialloreti LE, et al. Epidemiology and economic burden of herpes zoster and post-herpetic neuralgia in Italy: a retrospective, population-based study. BMC Infect Dis. 2010 3;10:230.]

Herpes Zoster hospitalizations in Italy

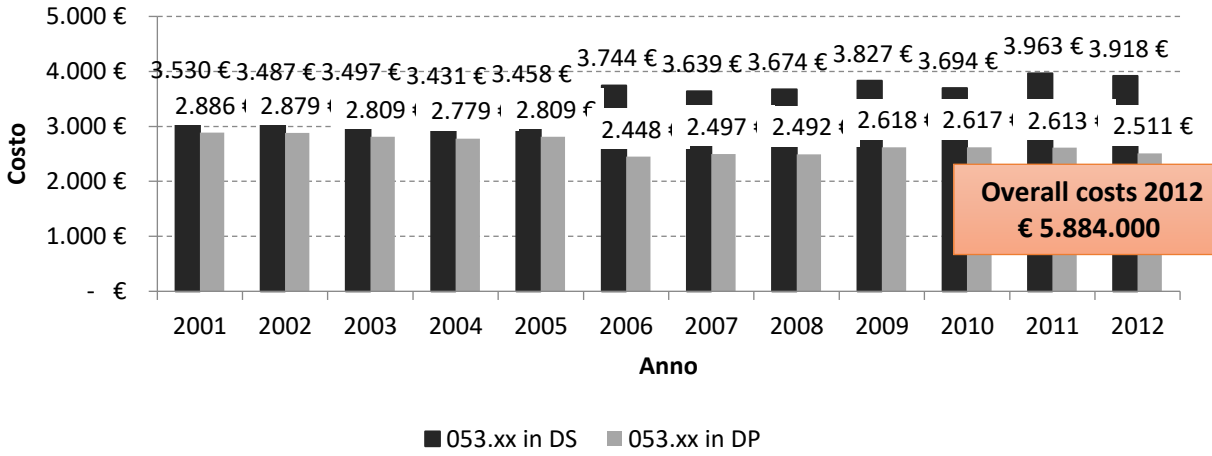
- **Stable length of stay** over time



Average cost of Hospitalization for HZ among the causes of hospitalization

Italy, 2001-2012

Overall cost 2012 € 12.211.000 €



Overall costs 2012 € 5.884.000

The reduction of hospitalization for HZ **as a contributing cause of hospitalization (secondary diagnosis):**

- **Less marked decrease** than hospitalization for HZ as the primary cause of hospitalization
- **High average hospital stay** (almost double compared to HZ as primary cause)
- **Increase in the average cost of hospitalizations**
  - In 2012 total expenditure >12.211.000 €

Herpes Zoster hospitalizations in Italy: cost associated

- **Reduction of hospitalization for HZ**
  - Hospitalization rates **in the elderly 15 times higher** than in the younger ones
  - **Stable length of stay** over time
  - **Increase in hospitalizations** in the **immunocompromised subjects**
  - **Average cost reduction**
    - In **2012** average cost **>5.800.000 €**
- **Hospitalization reduction for PHN**
  - In **2012**
    - 21% of hospitalizations for HZ
    - Total expenditure **>1.000.000 €**
- **Reduction of hospitalization for ophthalmic complications**

Human Vaccines & Immunotherapeutics

ISSN: 2164-5515 (Print) 2164-554X (Online) Journal homepage: http://www.tandfonline.com/loi/khvi20

Evaluation of the economic burden of Herpes Zoster (HZ) infection

Donatella Panatto, Nicola Luigi Bragazzi, Emanuela Rizzitelli, Paolo Bonanni, Sara Boccalini, Giancarlo Icardi, Roberto Gasparini & Daniela Amicizia

	HZ+PHN	HZ/treated case	PHN/treated case
Direct costs	34 €M	€ 196	€ 662
Indirect costs	15 €M	€ 657	€ 930
TOTAL	**49 €M**	**€ 853**	**€ 1.592**

The Burden of Disease of HZ in Italy has an economic impact of **49 M€/year** (direct and indirect costs)

Aging Clin Exp Res (2017) 29:771–779
DOI 10.1007/s40520-017-0782-z

ORIGINAL ARTICLE

Temporal trends in herpes zoster-related hospitalizations in Italy, 2001–2013: differences between regions that have or have not implemented varicella vaccination

Nicoletta Valente[1] · Silvia Cocchio[2] · Armando Stefanati[1] · Tatjana Baldovin[2] · Domenico Martinelli[3] · Rosa Prato[3] · Vincenzo Baldo[2] · Giovanni Gabutti[1]

	Primary diagnosis, *n* (%)	Secondary diagnosis, *n* (%)	Total
	47,198 (50.3)	46,610 (49.7)	93,808
Gender, *n* (%)			
Male	21,545 (45.6)	20,718 (44.4)	42,263 (45.1)
Female	25,653 (54.4)	25,892 (55.6)	51,545 (54.9)
Age class, *n* (%)	65 (20.0)	69 (17.8)	67 (19.0)
<18	2091 (4.4)	912 (2.0)	3003 (3.2)
18–49	6431 (13.6)	5655 (12.1)	12,086 (12.9)
50–59	5160 (10.9)	4000 (8.6)	9160 (9.8)
60–69	9018 (19.1)	7790 (16.7)	16,808 (17.9)
70–79	13,495 (28.6)	13,596 (29.2)	27,091 (28.9)
80+	11,003 (23.3)	14,657 (31.4)	25,660 (27.4)
Average length of stay, average (SD)	15.6 (13.3)	27.0 (31.8)	21.3 (25.0)
Discharge, *n* (%)			
Alive	47,060 (99.7)	45,477 (97.6)	92,537 (98.6)
Dead	138 (0.3)	1133 (2.4)	1271 (1.4)
Type of hospitalization, *n* (%)			
Ordinary hospitalization	41,669 (88.3)	41,419 (88.9)	83,088 (88.6)
Day-hospital admission	5529 (11.7)	5191 (11.1)	10,720 (11.4)
HZ, *n* (%)			
Uncomplicated	22,377 (47.4)	27,541 (59.1)	49,918 (53.2)
With complications	24,821 (52.6)	19,069 (40.9)	43,890 (46.8)
Neurological	12,052 (25.5)	9814 (21.1)	21,866 (23.3)
Ophtalmic	7431 (15.7)	5111 (11.0)	12,542 (13.4)
Other specified complications	3606 (7.6)	2397 (5.1)	6003 (6.4)
Other unspecified complications	1732 (3.7)	1747 (3.7)	3479 (3.7)
Co-morbidity, *n* (%)			
Malignancy	3092 (6.6)	7608 (16.3)	10,700 (11.4)
COPD	2387 (5.1)	4983 (10.7)	7370 (7.9)
Kidney failure	1514 (3.2)	3421 (7.3)	4935 (5.3)
Diabetes	4736 (10.0)	5432 (11.7)	10,168 (10.8)
Autoimmune diseases	655 (1.4)	781 (1.7)	1436 (1.5)

Temporal trends in herpes zoster-related hospitalizations in Italy, 2001–2013: differences between regions that have or have not implemented varicella vaccination

- In the period **2001–2013**, 93,808 HZ hospitalizations were registered.
- **Age represents a risk factor for HZ**, due to the decline in VZV-specific cell-mediated immunity.
- **Complicated HZ** was diagnosed in **53.2% of cases.**
- **32.5% of hospitalizations** involved **subjects with at least one comorbidity**.
  - **Co-morbidities** were higher in hospitalizations with HZ in **secondary diagnosis** than those in primary diagnosis (**41.5%** versus **23.6%** respectively, $p < 0.01$).
- HZ was associated with **malignancies (11.4%)**, **diabetes (10.8%)**, **COPD (7.9%)**, **kidney failure (5.3%)** and **autoimmune diseases (1.5%)** of cases.

Valente N, Cocchio S, Stefanati A, Baldovin T, Martinelli D, Prato R, Baldo V, Gabutti G. Aging Clin Exp Res. 2017 Aug;29(4):771-779. doi: 10.1007/s40520-017-0782-z.

Aging Clin Exp Res (2017) 29:771–779
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ORIGINAL ARTICLE

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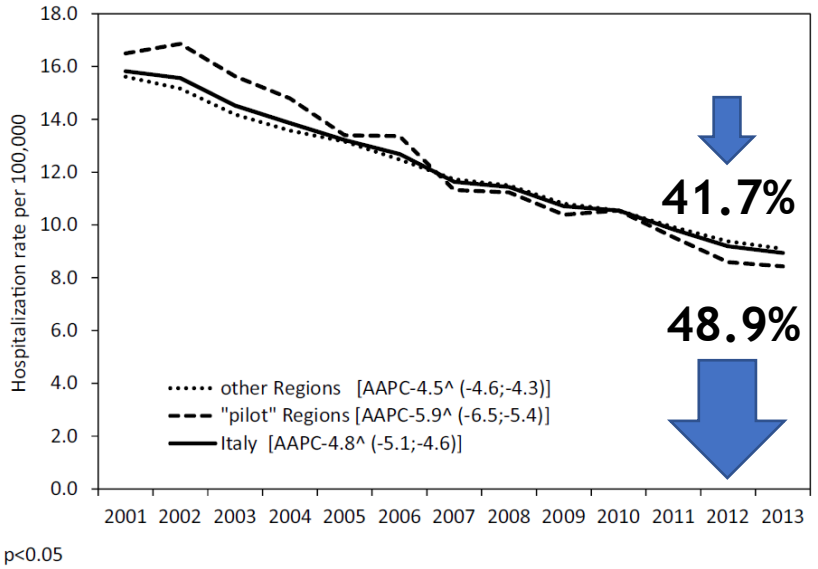
Temporal trends in herpes zoster-related hospitalizations in Italy, 2001–2013: differences between regions that have or have not implemented varicella vaccination



p<0.05

The **data** obtained **confirm** the epidemiological **impact of HZ** and its complications and **the need of a preventive approach.**

- In **the three Italian "pilot" regions a greater decrease of HZ-related hospitalization rates** occurred in comparison to other regions (Sicily UVV in 2003, Veneto in 2005 and Apulia in 2006).
- Extensive vaccination for varicella, reducing the spreading of VZV in the community and, therefore, eliminating the exogenous boosters, could increase the incidence of HZ in the unimmunized population (adults, elderly). *Not investigated the vaccination status of cases*!
- **This decrease,** consistent with the national trend, could be induced **by the reduction of inappropriateness of admissions and by the possible changes of care settings in place in our country**

Valente N, Cocchio S, Stefanati A, Baldovin T, Martinelli D, Prato R, Baldo V, Gabutti G. Aging Clin Exp Res. 2017 Aug;29(4):771-779. doi: 10.1007/s40520-017-0782-z.

HZ hospitalizations in Italy – recent data

Aging Clinical and Experimental Research (2022) 34:881–886
https://doi.org/10.1007/s40520-021-02014-7

ORIGINAL ARTICLE

Decline in hospitalization rates for herpes zoster in Italy (2003–2018): reduction in the burden of disease or changing of hospitalization criteria?

Emanuele Amodio[1] · Alessandro Marrella[1] · Alessandra Casuccio[1] · Francesco Vitale[1]

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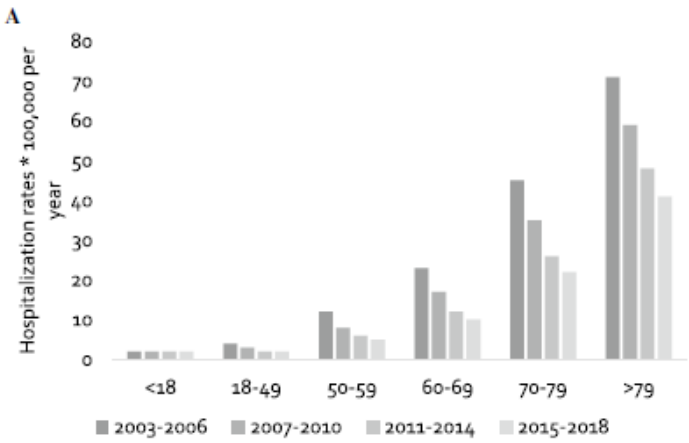
Objective: **to estimate the burden of the HZ hospitalizations in Italy** from **2003 to 2018** evaluating temporal trends. Overall, 99,036 patients were hospitalized with HZ in the 16-year period of the study, and 83,720 (84.5%) were over 50 years.

- **Hospitalization rate** showed **a decreasing trend** from **13.9 in 2003–2006 to 7.8 in 2015–2018** ($p < 0.001$).
- **Hospitalization rates** showed a **20-fold higher risk among subjects aged over 80 years** and **11-fold higher risk among 70–79-year-old subjects** with respect to those aged less than 50 years.
- Over time, **a statistically significant increase was observed for the case fatality rate** (**from 1.2 to 1.7%;** $p < 0.001$) and **the median length of stay** (**from 7 to 8 days**; $p < 0.001$).

Fig. 1 Hospitalization rates due to Herpes Zoster in Italy from 2003 to 2018 stratified by age-group and period (**1A**) and over-time relative risk of hospitalization compared to 0–49 age class hospitalization rates (**1B**)



The **observed reduced trend** over time could be due to a **restriction in hospitalization criteria** instead of a reduced burden of disease

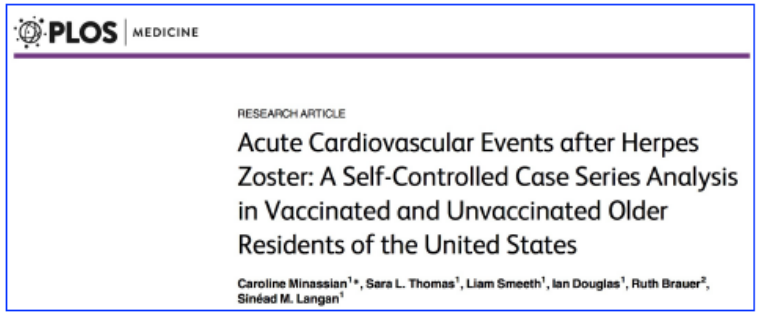
Increased incidence of stroke after HZ


Stroke (HP Adams, Section Editor)
Current Neurology and Neuroscience Reports
April 2015, 15:16

First online: 25 February 2015

The Relationship Between Herpes Zoster and Stroke

Maria A. Nagel ✉, Don Gilden


PLOS | MEDICINE

RESEARCH ARTICLE

Acute Cardiovascular Events after Herpes Zoster: A Self-Controlled Case Series Analysis in Vaccinated and Unvaccinated Older Residents of the United States

Caroline Minassian[1]*, Sara L. Thomas[1], Liam Smeeth[1], Ian Douglas[1], Ruth Brauer[2], Sinéad M. Langan[1]

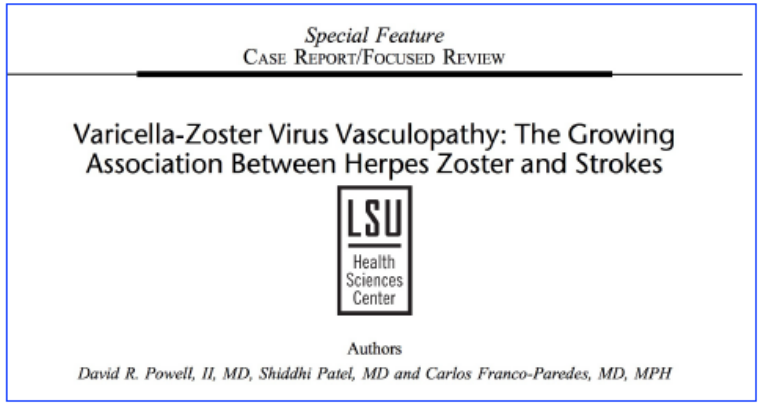

Sundström et al. BMC Infectious Diseases (2015) 15:488
DOI 10.1186/s12879-015-1170-y

BMC Infectious Diseases

RESEARCH ARTICLE Open Access

Incidence of herpes zoster and associated events including stroke—a population-based cohort study

Karin Sundström[1], Caroline E. Weibull[2], Karin Söderberg-Löfdal[3], Tomas Bergström[4], Pär Sparén[2] and Lisen Arnheim-Dahlström[2*]

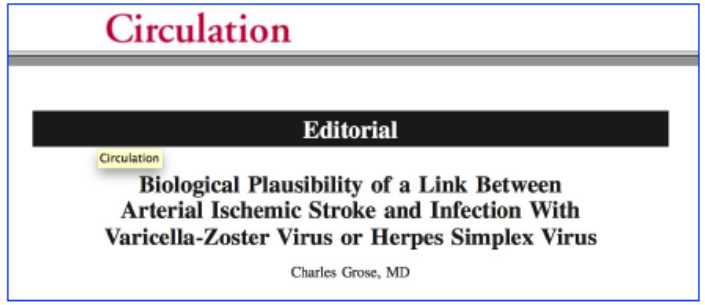

Special Feature
CASE REPORT/FOCUSED REVIEW

Varicella-Zoster Virus Vasculopathy: The Growing Association Between Herpes Zoster and Strokes

LSU Health Sciences Center

Authors

David R. Powell, II, MD, Shiddhi Patel, MD and Carlos Franco-Paredes, MD, MPH


Circulation

Editorial

Circulation

Biological Plausibility of a Link Between Arterial Ischemic Stroke and Infection With Varicella-Zoster Virus or Herpes Simplex Virus

Charles Grose, MD

- Stroke rate after HZ increased: **x 1.5 within 1 month**
  – weeks 1–4 (IR* 1.63)
  – weeks 5–12 (IR 1.42)
  – weeks 13–26 (IR 1.23)

- The correlation is strongest in cases of ophthalmic zoster: **x 4 within 1 year**

Open Forum Infectious Diseases
MAJOR ARTICLE

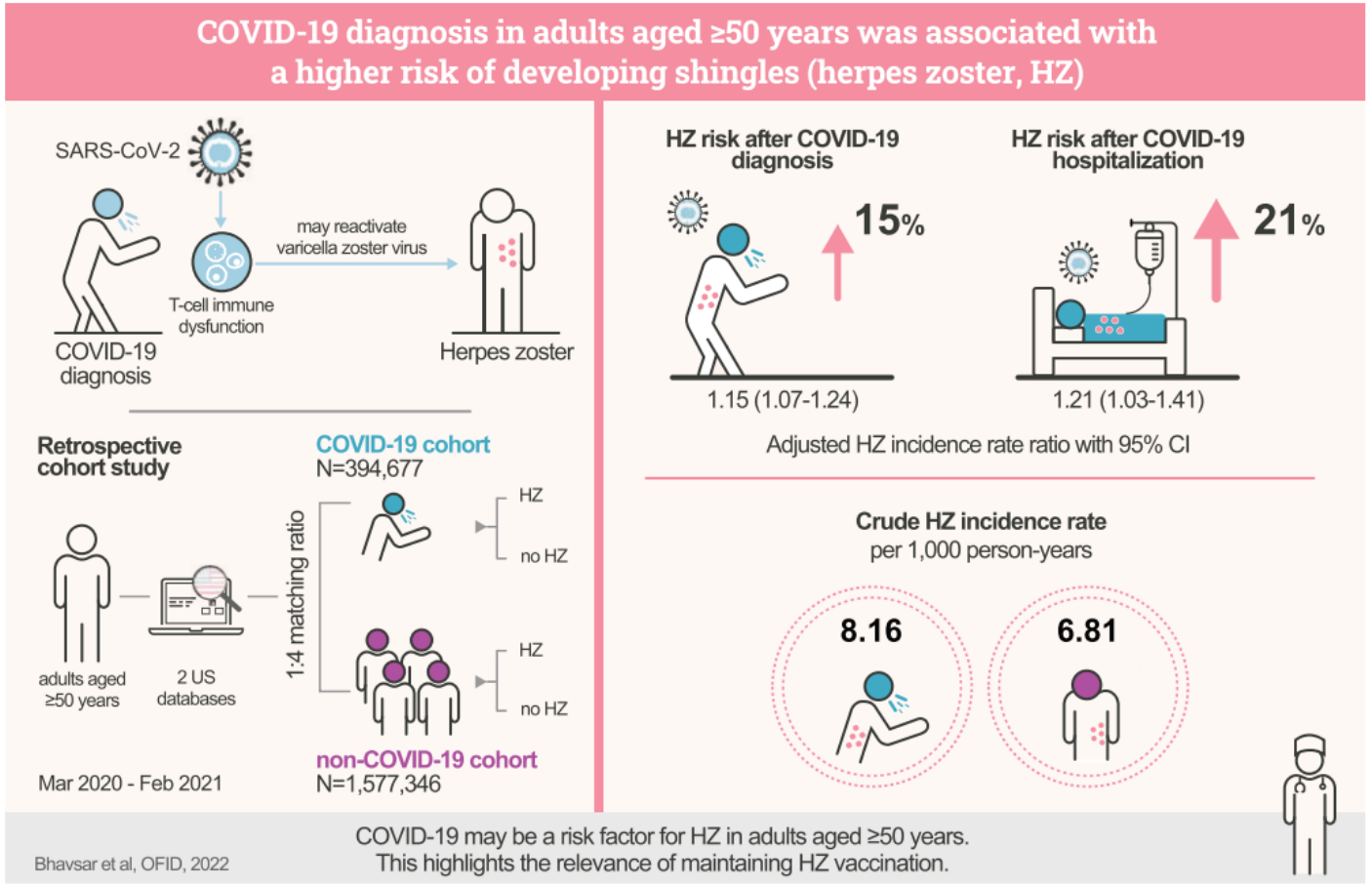
Risk of HZ and COVID-19?

Increased Risk of Herpes Zoster in Adults ≥50 Years Old Diagnosed With COVID-19 in the United States

Amit Bhavsar,[1] Germain Lonnet,[2] Chengbin Wang,[3] Konstantina Chatzikonstantinidou,[4] Raunak Parikh,[1] Yves Brabant,[1] Nathalie Servotte,[1] Meng Shi,[3] Robyn Widenmaier,[3] and Emmanuel Aris[1]

[1]GSK, Wavre, Belgium, [2]Business & Decision Life Sciences, Brussels, Belgium, c/o GSK, Wavre, Belgium, [3]GSK, Rockville, Maryland, USA, and [4]Aixial, an Alten Company, Brussels, Belgium, c/o GSK, Wavre, Belgium

- A retrospective cohort study to assess the risk of developing HZ following a COVID-19 diagnosis.



- Individuals diagnosed with COVID-19:
- a **15% higher HZ risk than those without COVID-19** (aIRR, 1.15; 95% CI, 1.07-1.24; *P* < .001).
- **The increased HZ risk was more pronounced (21%)** following COVID-19 hospitalization (aIRR, 1.21; 95% CI, 1.03-1.41; *P* = .02).

SARS-CoV-2 infection may trigger reactivation of latent VZV?

Bhavsar A et al. Increased Risk of Herpes Zoster in Adults ≥50 Years Old Diagnosed With COVID-19 in the United States. Open Forum Infect Dis. 2022 Mar 9;9(5):ofac118. doi: 10.1093/ofid/ofac118.

HZV preventive strategies in Europe and Italy

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The relevance for public health of Herpes Zoster vaccine prevention

- Herpes Zoster is a **painful disease**. If complicated by Post Herpetic Neuralgia it can become **extremely debilitating for a long time**.
- 95% of the world's population is at risk of HZ[1]
- 1 out of 4 subjects will be able to develop HZ[2]
- The risk of HZ and PHN increases with increasing age[3]
- The treatment of HZ and PHN is complex and not very effective[4]
- The classic paradigm of vaccinations is changing: Vaccination is not only directed against acute childhood diseases with the aim of preventing deaths and serious cases, but also **to improve the quality of life at all ages**.

Varicella virus infection was very common in the pre-vaccine era.

↓

95% of the European adult population has anti-VZV antibodies (99% of Italian men and women aged over 65 years are VZV seropositive)

↓

In the absence of vaccination, virtually everyone contracts varicella by the age of 40 years

↓

Anyone who has come into contact with the Varicella Zoster Virus (VZV) has the potential to develop Herpes Zoster.

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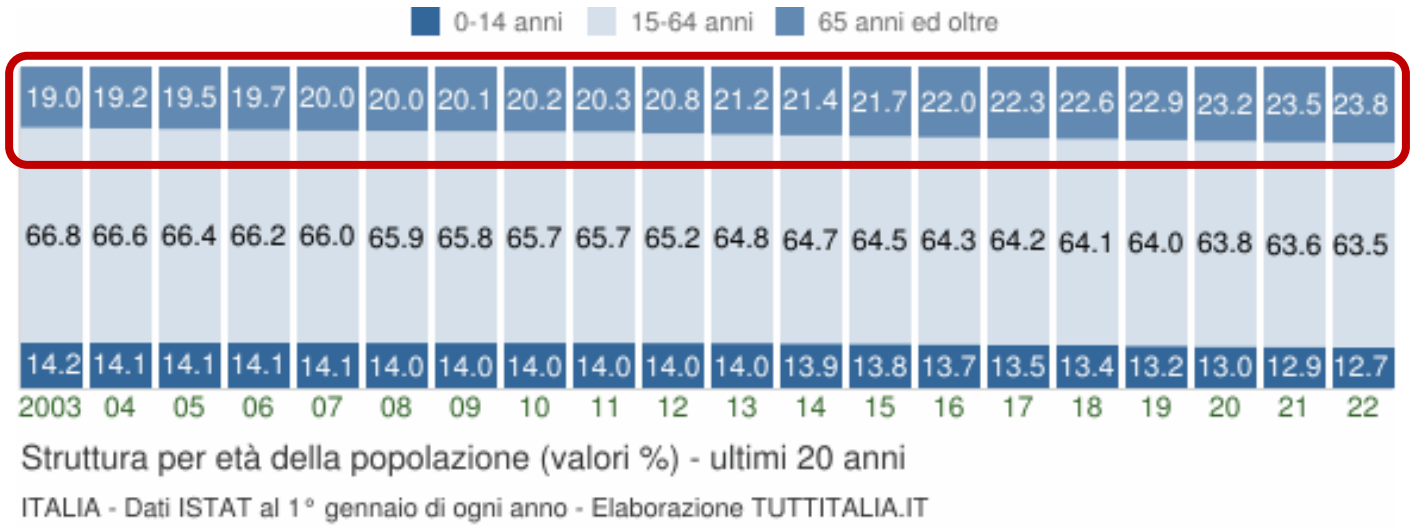
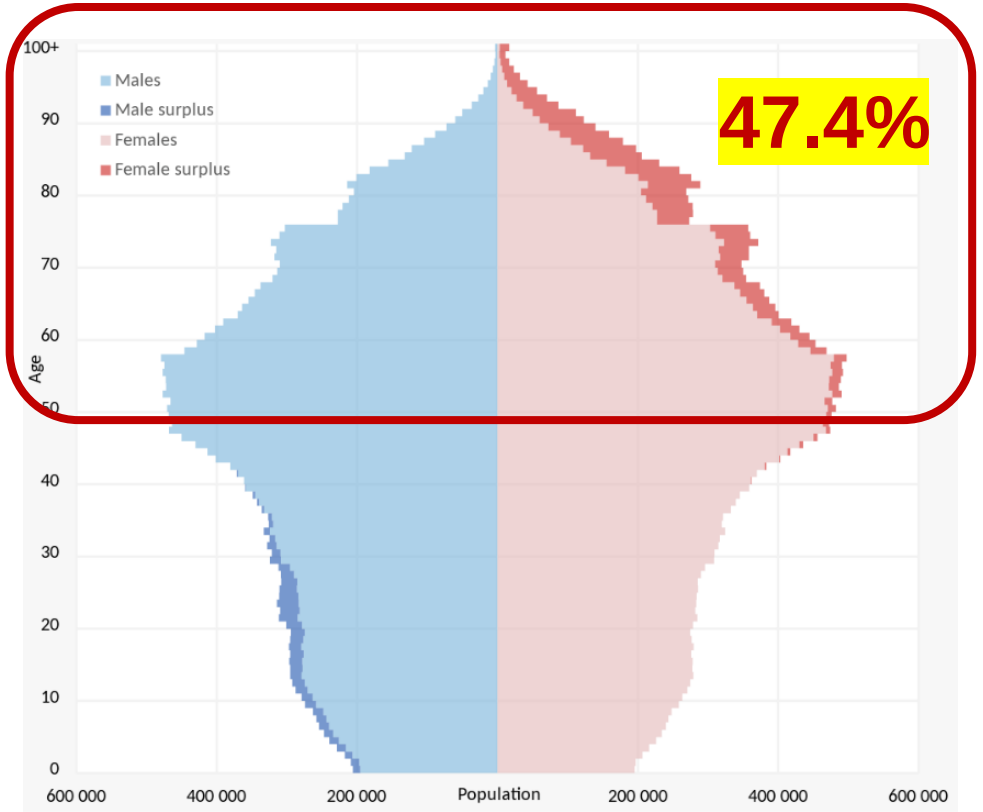
1) Johnson 2007 Expert Rev Neurother; 2) Bowsher 1999; Miller 1993; Schmader 2001 CID; 3) Hope-Simpson 1975; Burke 1982; 4) Schmader 2006 CG; Dworkin 2003;

Italian Population in the last 2 decades and in 2023

Italian population: 58.850.717
(National Institute of statistics - 1/01/2023)

Elderly ≥65 years of age: 24.1% (>14 millions)
People over 50 years of age: 47.4% (28 millions >50 years)
a 2-fold increase compared to the study of Gialloreti et al.





- The **decay of the CMI is strictly age-dependent, increasing with age**.

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Two available vaccines

Live herpes zoster vaccine (ZVL) product profile

- Vaccino vivo attenuato
- Contiene ceppo Oka/Merck di VZV
- Indicato per la prevenzione dell'HZ (e della PHN associata all'HZ [solo Europa e Australia]) in individui di 50 anni di età o più anziani
- Somministrato come iniezione singola; SC o IM (in base alla licenza specifica)
  Conservazione: congelato o in frigorifero (variabile a seconda della formulazione commercializzata)
- Controindicato in popolazioni IC

HZ, herpes zoster; IC, immunocompromesso; IM, intramuscolare, PHN, nevralgia post-erpetica; SC, sottocutaneo; VZV, virus della varicella zoster

1. Merck & Co. *Zostavax* Prescribing information: FDA; [updated Sept 2019]. Available from: ttps://www.merck.com/product/usa/pi_circulars/z/zostavax/zostavax_pi2.pdf ; 2. MSD Vaccins *Zostavax* European public assessment report, Annex I: Summary of product characteristics: EMA; [updated Jan 2019]. Available from https://www.ema.europa.eu/documents/product-information/zostavax-epar-product-information_en.pdf ; 3. Merck Canada Inc. Zostavax II product Monograph [updated Aug 2018]. Available from: https://www.merck.ca/static/pdf/ZOSTAVAX_II-PM_E.pdf ; 4. Merck Sharp & Dohme (Australia) Pty Limited. Zostavax Product Information [updated July 2019]. Available at https://www.ebs.tga.gov.au/ebs/picmi/picmirepository.nsf/pdf?OpenAgent&id=CP-2010-PI-01547-3&d=201811291016933.

The ZVL vaccine has made an important contribution to the prevention of zoster and post-herpetic neuralgia, **is contraindicated for immunocompromised subjects (vaccine coverage has so far been sub-optimal)**

RZV product profile

- Non-live subunit vaccine containing glycoprotein E[1,2]
- Use the helper system AS01$_B$[1,2]
- Indicated for prevention of HZ (and PHN [Europe, Australia, New Zealand only]) in adults ≥50 years of age, based on Phase III studies3-9* (and for adults 18 years of age and older at greatest risk of HZ [Europe only])[4]
- Given in two IM doses, 2–6 months apart[3-8*]
  Storage: In the refrigerator
- Not contraindicated in immunocompromised individuals[3-8]

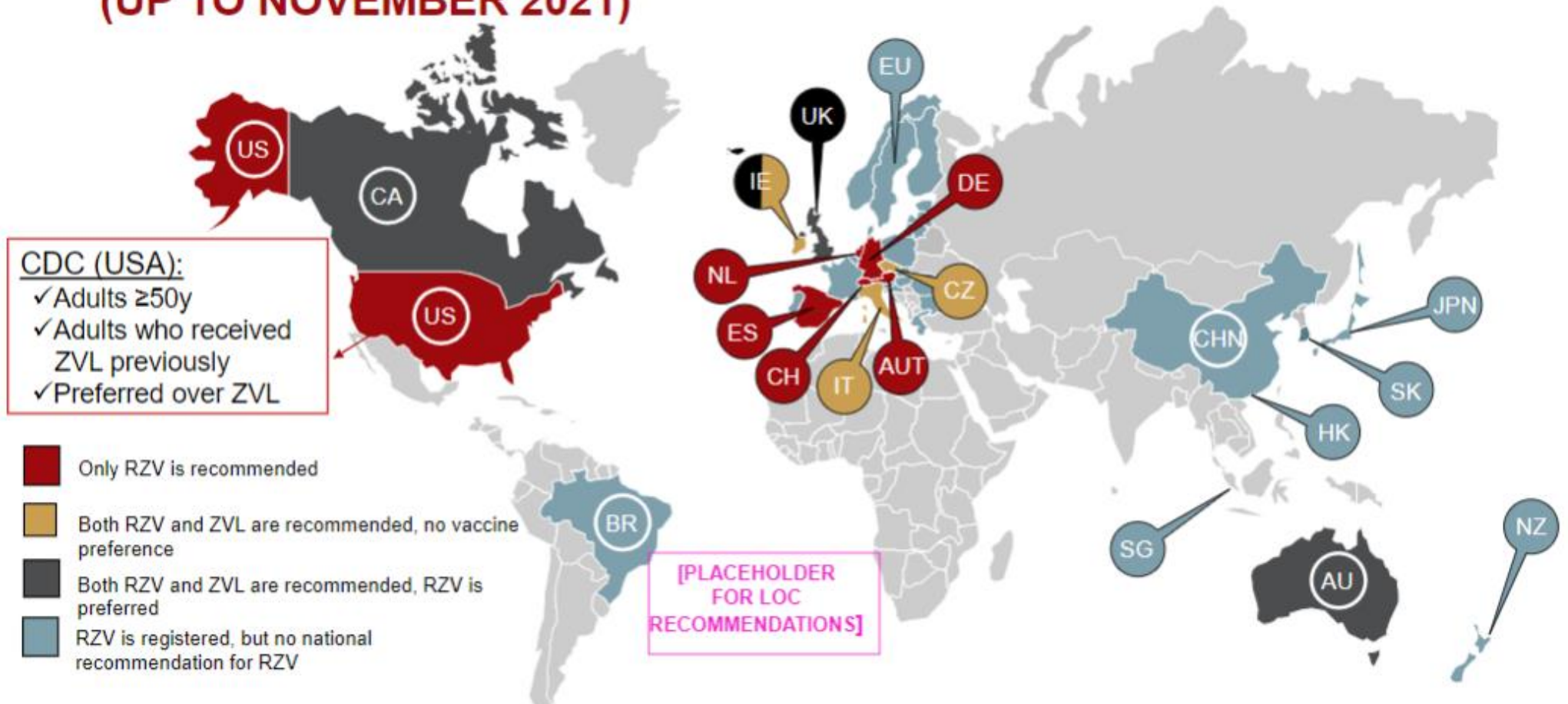
RZV ha ottenuto l'approvazione regolatoria a ottobre 2017 in Canada e negli Stati Uniti, a **marzo 2018 in Europa e Giappone**, a luglio 2018 in Australia, a maggio 2019 in Cina e a gennaio 2020 in Nuova Zelanda.
Per i soggetti che sono o potrebbero diventare immunodeficienti o immunosoppressi a causa di malattia o terapia e che trarrebbero beneficio da un programma di vaccinazione più breve, la seconda dose può essere somministrata da 1 a 2 mesi dopo la dose iniziale **(solo Europa)**[4]
†L'indicazione e la schedula concesse in licenza sono definite dalle rispettive autorità regolatorie.
IC, immunocompromesso; IM, intramuscolare; PHN, nevralgia post-erpetica

1. Lal H, *et al. N Engl J Med* 2015;372:2087–96; 2. Cunningham AL, *et al. N Engl J Med* 2016;75:1019–32; 3. Shingrix Prescribing information: US FDA; [revised May 2019]. Available from: https://www.gsksource.com/pharma/content/dam/GlaxoSmithKline/US/en/Prescribing_Information/Shingrix/pdf/SHINGRIX.PDF; 4. Shingrix. European public assessment report, Annex I: Summary of product characteristics: EMA; [revised September 2020]. Available from: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/004336/WC500246550.pdf ; 5. Shingrix Product Monograph, Canada [revised June 3, 2020]. Available from: http://ca.gsk.com/media/1350788/shingrix_pm-2017-10-13.pdf; 6. Shingrix Prescribing information. Japan PMDA. [updated Aug 2018]. Available at: http://www.info.pmda.go.jp/go/pdf/342275_631341BE1028_1_01; 7. Shingrix Product Information: Australian Register of Therapeutic Goods. [Effective date April 2019].Available at: http://search.tga.gov.au/s/search.html?collection=tga-artg&profile=record&meta_i=289257; 8. GSK Press Release. GSK announces approval of Shingrix in China for prevention of shingles in adults aged 50 and over. May 23, 2019. https://www.gsk.com/en-gb/media/press-releases/gsk-announces-approval-of-shingrix-in-china-for-prevention-of-shingles-in-adults-aged-50-and-over/ 9. Medsafe. Medicines – Medsafe Product Detail: Shingrix. https://www.medsafe.govt.nz/regulatory/ProductDetail.asp?ID=20173

The RZV vaccine represents a significant advance in terms of efficacy and duration of protection, and **it is also the only weapon for the prevention of HZ in highly immunocompromised subjects**

Vaccination acts by maintaining the level of Cell-mediated immunity over time

HZ RECOMMENDATIONS IN COUNTRIES WHERE RZV IS REGISTERED (UP TO NOVEMBER 2021)



CDC (USA):
- ✓Adults ≥50y
- ✓Adults who received ZVL previously
- ✓Preferred over ZVL

- Only RZV is recommended
- Both RZV and ZVL are recommended, no vaccine preference
- Both RZV and ZVL are recommended, RZV is preferred
- RZV is registered, but no national recommendation for RZV

AUT, CA, CZ, DE, ES, IE, IT, NL, UK, US: Parikh R, et al. Expert Rev Vaccines 2021;20(9):1065-1075
AU: AUSTRALIAN TECHNICAL ADVISORY GROUP ON IMMUNISATION (ATAGI). Available: https://www.health.gov.au/sites/default/files/documents/2021/06/statement-on-the-clinical-use-of-zoster-vaccine-in-older-adults-in-australia-statement-on-the-clinical-use-of-zoster-vaccine-in-older-adults-in-australia.pdf CH: Switzerland-Shingrix Vaccination Recommendation Officially Published available here: https://www.bag.admin.ch/dam/bag/fr/dokumente/mt/i-und-b/richtlinien-empfehlungen/empfehlungen-spezifische-erreger-krankheiten/herpes-zoster/impfempfehlung-herpes-zoster.pdf.download.pdf/impfempfehlung-herpes-zoster-fr.pdf, REF-148537 Data on File: DOF 2022N498004_00 - Countries where Shingrix is launched, Updated on 25 Jan 2022

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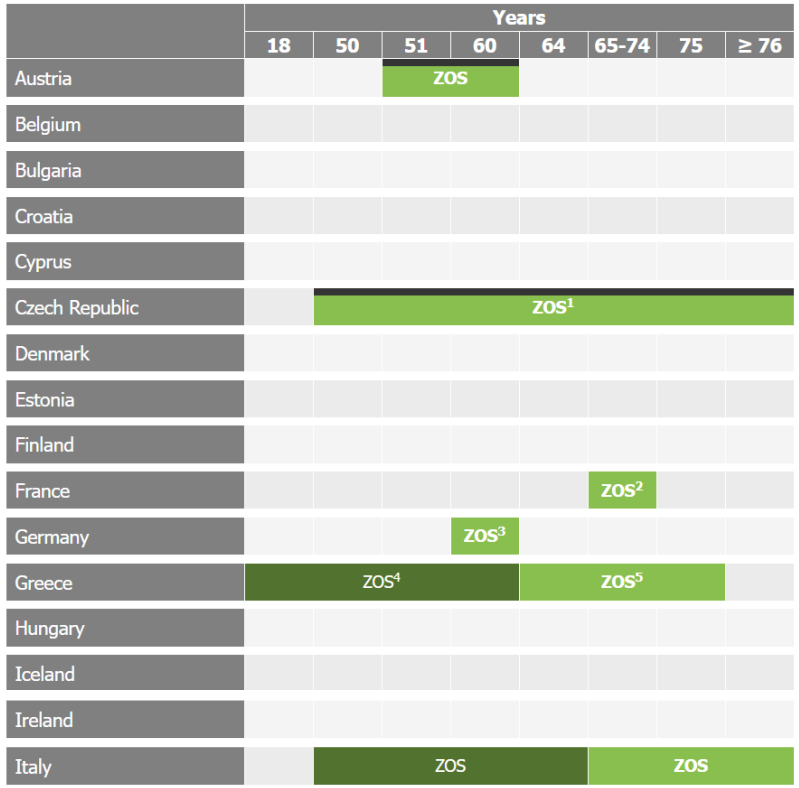
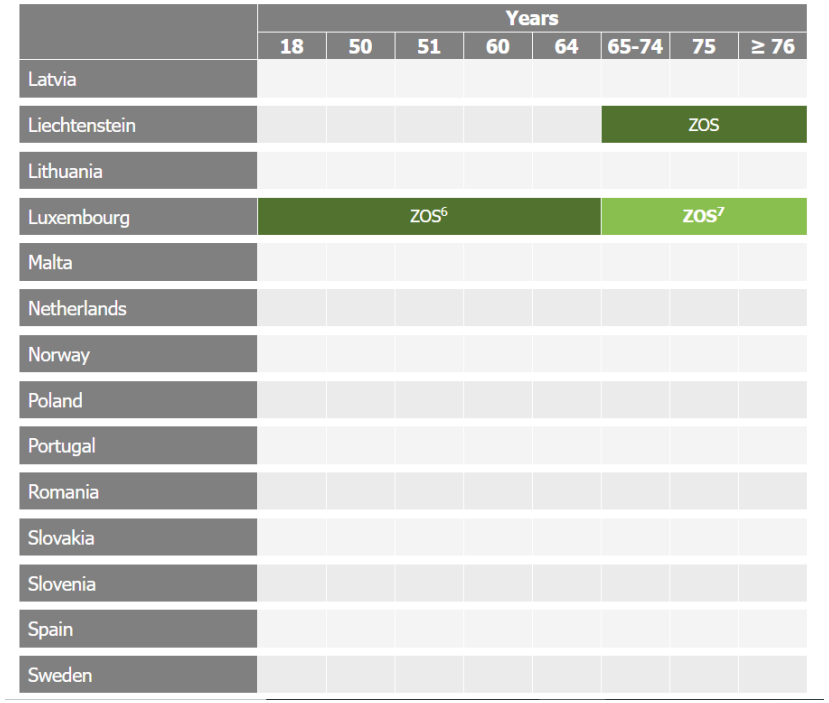
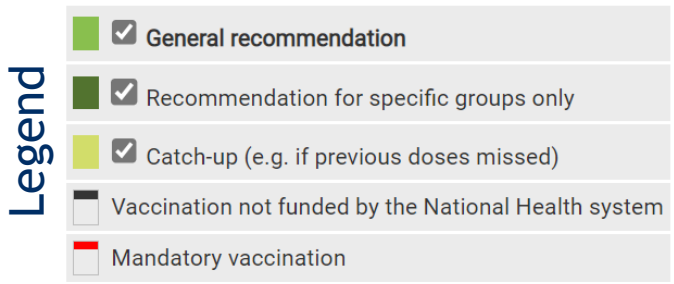
Herpes Zoster recommended vaccination in European Countries

Vaccine Scheduler







- **Only 8 countries recommend Herpes Zoster Vaccination.**
- **In 2 countries it is not funded by the NHS.**

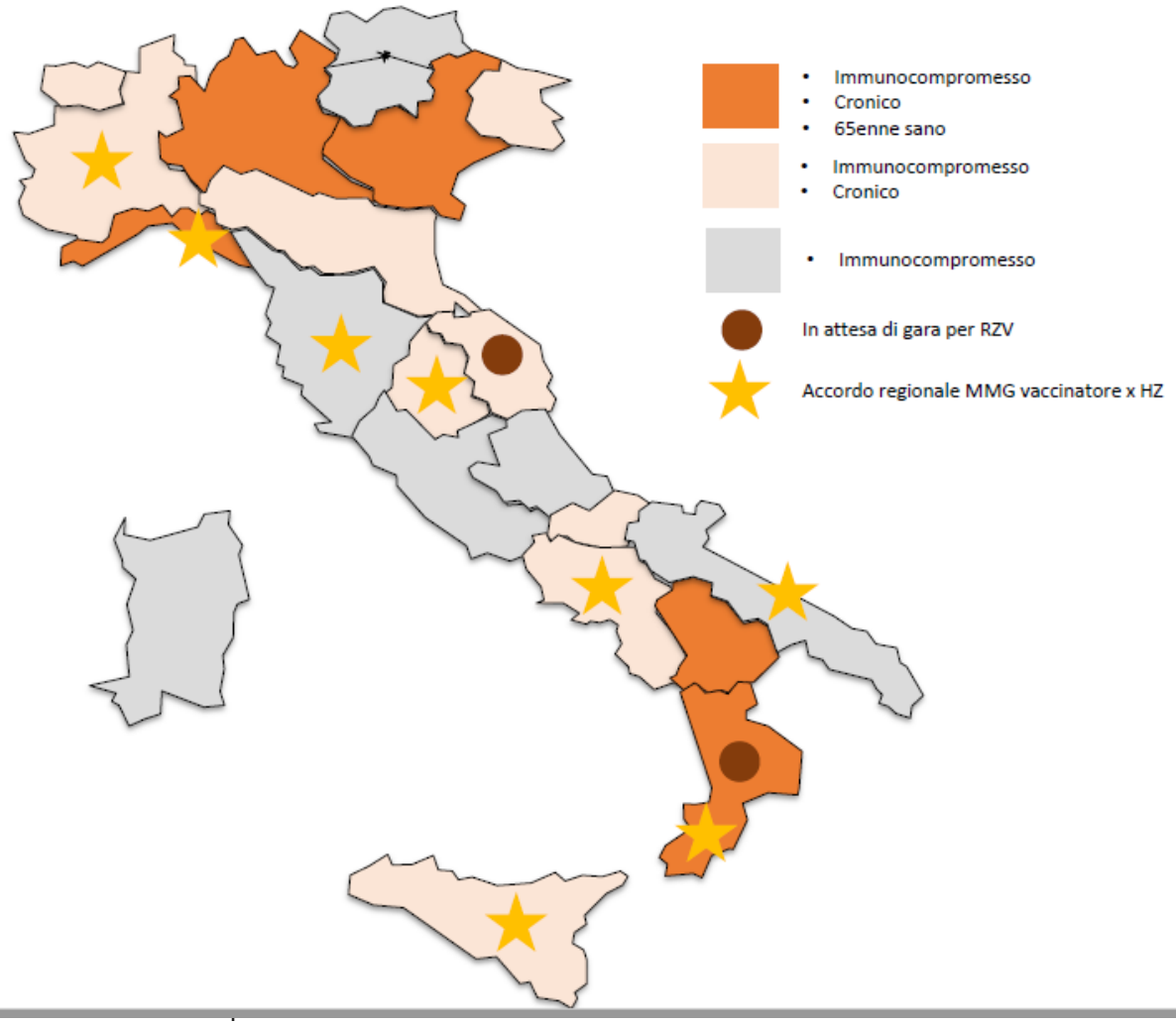
- **Diabetes**
- **Cardiovascular pathologies**
- **COPD**
- **Subjects scheduled for immunosuppressive therapy**

Italy:

- **general recommendation for subjects over 65 years old since NIP 2017-19**
- **recommendation for specific risk groups for subjects aged 50 - 64 years**

Offerta vaccinale regionale del vaccino ricombinante adiuvato per la prevenzione dell' Herpes Zoster

- Indicazione omogenea per il paziente 18 + immunocompromesso
- Etereogenicità per il paziente cronico in termini di: indicazioni, sotto-categorie e età
- Per la coorte del 65 enne sano indicazione di utilizzo prevalente per ZVL



ABRUZZO	• Soggetti 18 +
BASILICATA	• Adulti di età pari a 65 anni • Individui ad aumentato rischio a partire dai 18 anni di età
CALABRIA	• Per adulti di età uguale o superiore a 50 e per adulti di età uguale o superiore 18 anni ad aumentato rischio di Herpes Zoster. Coorte 65° anno e 70° anno di età
CAMPANIA	• Soggetti 18+ cronici e immunocompromessi • Soggetti 50+ altamente fragili e ad aumentato rischio
EMILIA-ROMAGNA	• Soggetti 18+ cronici e immunocompromessi • Soggetti 50+ ad aumentato rischio
FRIULI VENEZIA GIULIA	• Soggetti 18+ cronici • Soggetti 18+ immunocompromessl • Soggetti 18 + con recidive o forme particolarmente gravi di HZ
LAZIO	• Soggetti 18+ immunocompromessi • Soggetti 18 + con recidive o forme particolarmente gravi di HZ
LIGURIA	• Soggetti di 65 anni di età • Soggetti 50 + cronici da PNPV • Soggetti 18+ immunocompromessi
LOMBARDIA	• Soggetti 18 + cronici complicati • Soggetti 18 + immunocomproemssi • Ospiti RSA (65 enni e 50- + cronici/immunocompromessi • Soggetti 18 + con recidive o con forme particolarmente gravi di Herpes Zoster
MARCHE	• Soggetti 18+ ad aumentato rischio
MOLISE	• Soggetti 18+ cronici e immunocompromessi • Soggetti 50+ ad aumentato rischio
PA BOLZANO	• Soggetti 18 + immunocompromessi • Soggetti con insufficienza renale cronica in dialisi • Soggetti 18+ con recidive o con forme particolarmente gravi di Herpes Zoster
PA TRENTO	• soggetti immunocompromessi
PIEMONTE	• Soggetti 18+ cronici e immunocompromessi • Soggetti 18+ con recidive o con forme particolarmente gravi di Herpes Zoste
PUGLIA	• Soggetti 50+ immunocompromessi • Soggetti 18+ ad aumentato rischio
SARDEGNA	• Soggetti 18+
SICILIA	• Soggetti 50+ • Soggetti 18+ immunocompromessi
TOSCANA	• No specifica su dettaglio popolazione
UMBRIA	• Soggetti 18 + immunocompromessi • Soggetti 18-49 cronici da PNPV
VENETO	• Soggetti 18-64 cronici e immunocompromessi • Soggetti 18+ con recidive o con forme particolarmente gravi di Herpes Zoster • Soggetti di età pari a 65 anni di età (chiamata per coorte) • Soggetti di età > di 65 anni

HZ Vaccination coverage in Italy??

- The Italian Ministry of Health, in the Circular of 9 March 2017, indicates as **vaccination coverage objectives**:
  - 20% for 2018
  - 35% for 2019
  - 50% for 2020

- VC against **HZ are not available at the national level**

Herpes Zoster awareness campaign in Italy

- **On TV from 17 July 2022, on the radio, digital, social networks**
- **construction of an ad hoc site dedicated to the pathology.**

The message is that: "**With the fire of Sant'Antonio you don't joke**".

The objective of the communication campaign is to increase **understanding of the impact of the disease on people's lives**, **debunking commonplaces** and **promoting prevention through vaccination.**

Those who experienced the disease know well that there is nothing to laugh about. They invite people to inform themselves and to protect themselves through vaccination.

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TROVAILMIOVACCINO
www.trovailmiovaccino.it

The FIND MY VACCINE webpage: an useful digital tool for the Italian CITIZEN but also for the HEALTHCARE OPERATOR to identify the recommended vaccinations based on the personal characteristics of the subject/patient

Autori: Sara Boccalini, Angela Bechini, Marco del Riccio, Alessandra Ninci, Paolo Bonanni

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The value of the Herpes Zoster vaccine consists in preventing the disease and its complications in order to keep all the elderly healthy (…and happy)

- In the future, probably the disease burden of Herpes Zoster will increase due to:
  - the aging of the population
  - the longer life expectancy
  - the increase in subjects with chronic diseases and fragile groups (immunocompromised)

Take home messages

- **Understanding the epidemiology of HZ disease** is fundamental to establish the most appropriate health strategies against HZ**.**

- The observed **downward trend** in hospitalizations in Italy must not in any way limit public health efforts in promoting HZ vaccination **especially in the elderly** and in **subjects with chronic diseases** who **continue to be at a higher risk** for severe sequelae due to the virus reactivation.

- **Vaccination Coverage for HZ in Italy** is lacking and it is a challenge for the future!

- With the **National Immunization Plan 2017-19**, Italy has introduced the active and free offer of the HZ vaccination **for all 65-year-olds and for some categories at risk. What's about the next NIP 2023-2025?**

- **Need to promote vaccination and increase awareness in HCWs and general population.**

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Thank you for your attention!