



ROMA | 4 OTTOBRE 2022 | STARHOTELS METROPOLE

Il valore della vaccinazione nel paziente diabetico

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ITALY**



Diapositiva preparata da AGOSTINO CONSOLI e ceduta alla Società Italiana di Diabetologia.
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DISCLOSURES

Bristol Mayer Squibb , Astra Zeneca, Boheringer Ingelheim, Eli Lilly, Merck Sharp & Dhome , Mundipharma, Novartis, Novo-Nordisk, Sanofi-Sintesis, Sigma-Tau, Takeda.
(Speaker)

Astra Zeneca, Bristol Mayer Squibb, Boheringer Ingelheim, Glaxo Smith Kline, Eli Lilly, Merck Sharp & Dhome, Novo-Nordisk.
(Advisory Board)

Astra Zeneca, Novo-Nordisk
(Consultant)

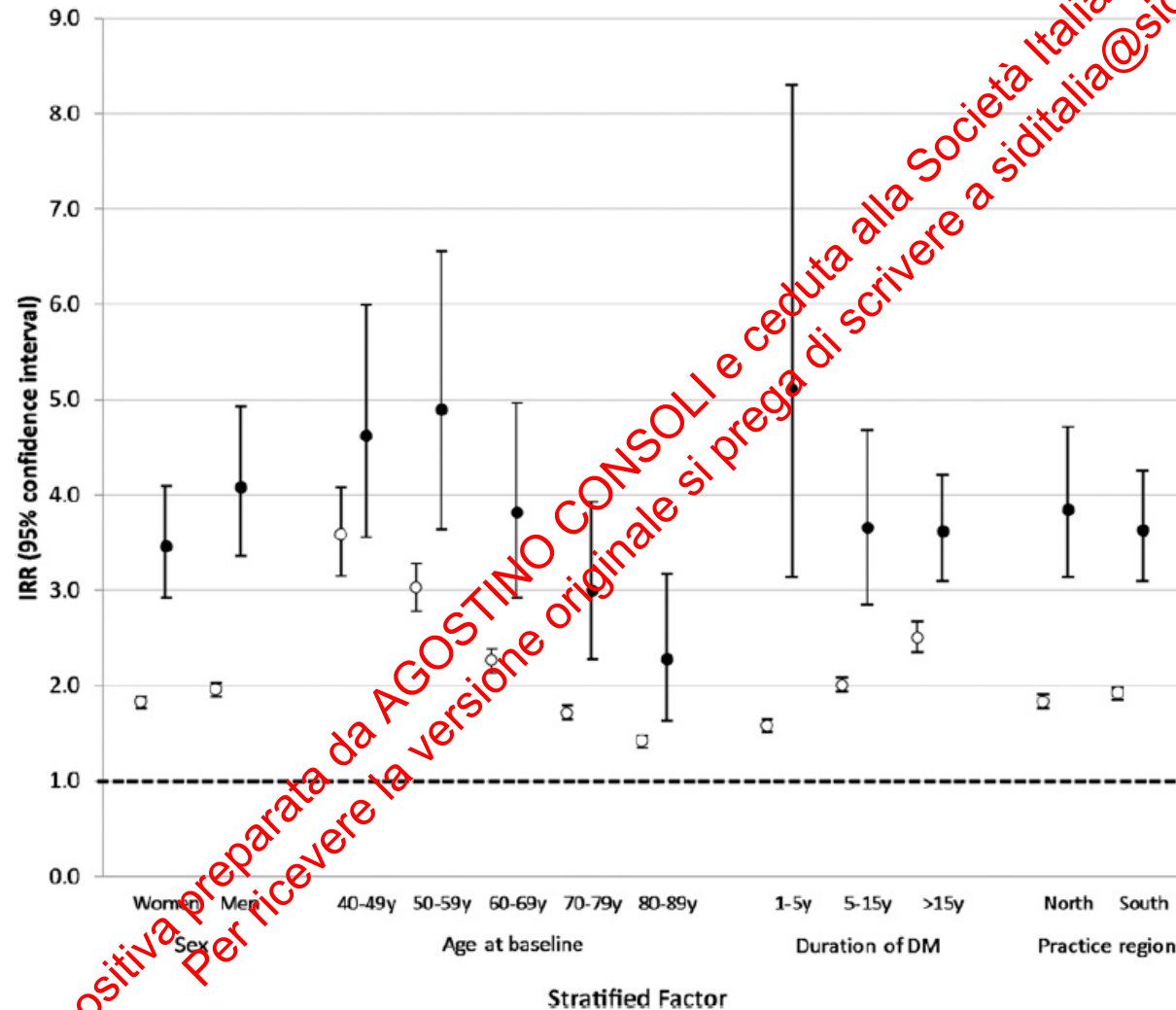
Eli Lilly, Novo-Nordisk
(Research Grant)

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Infection Risk is increased in Diabetes

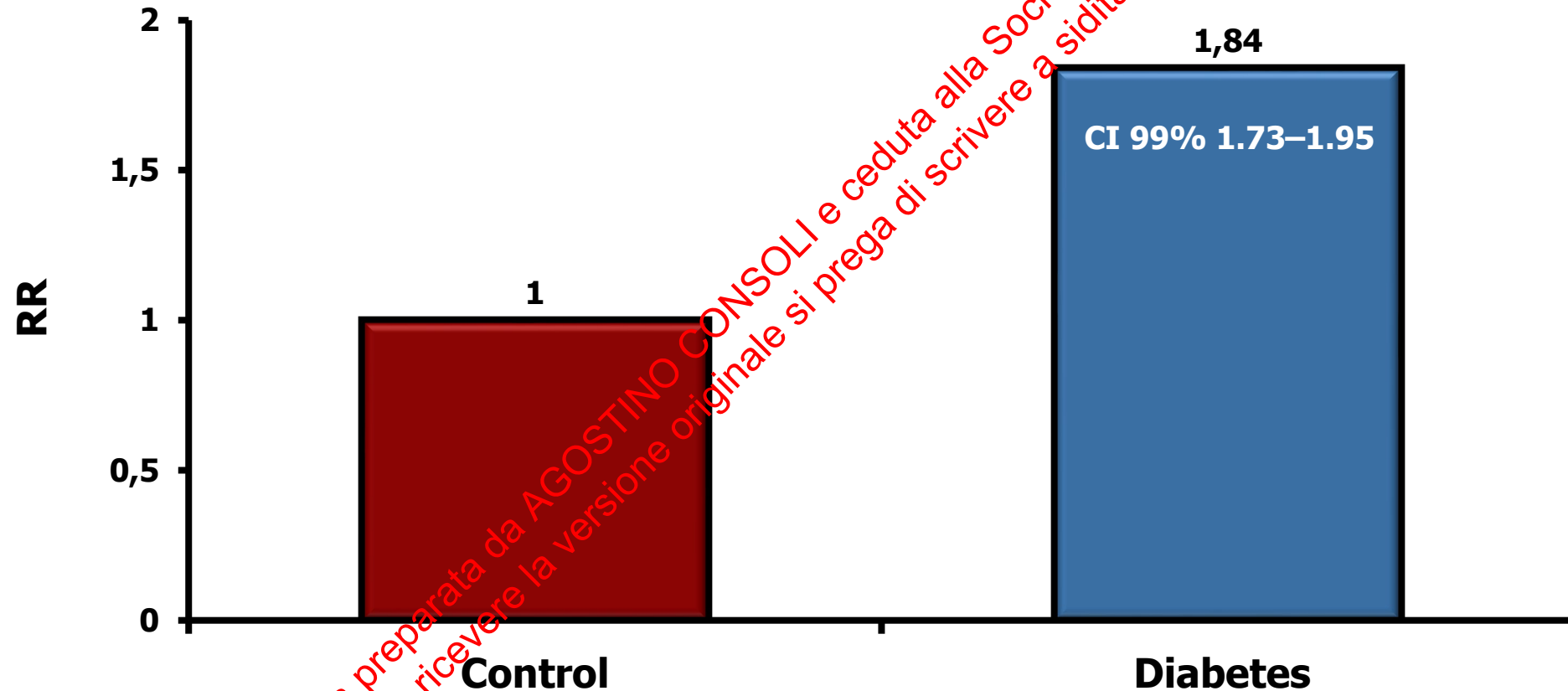
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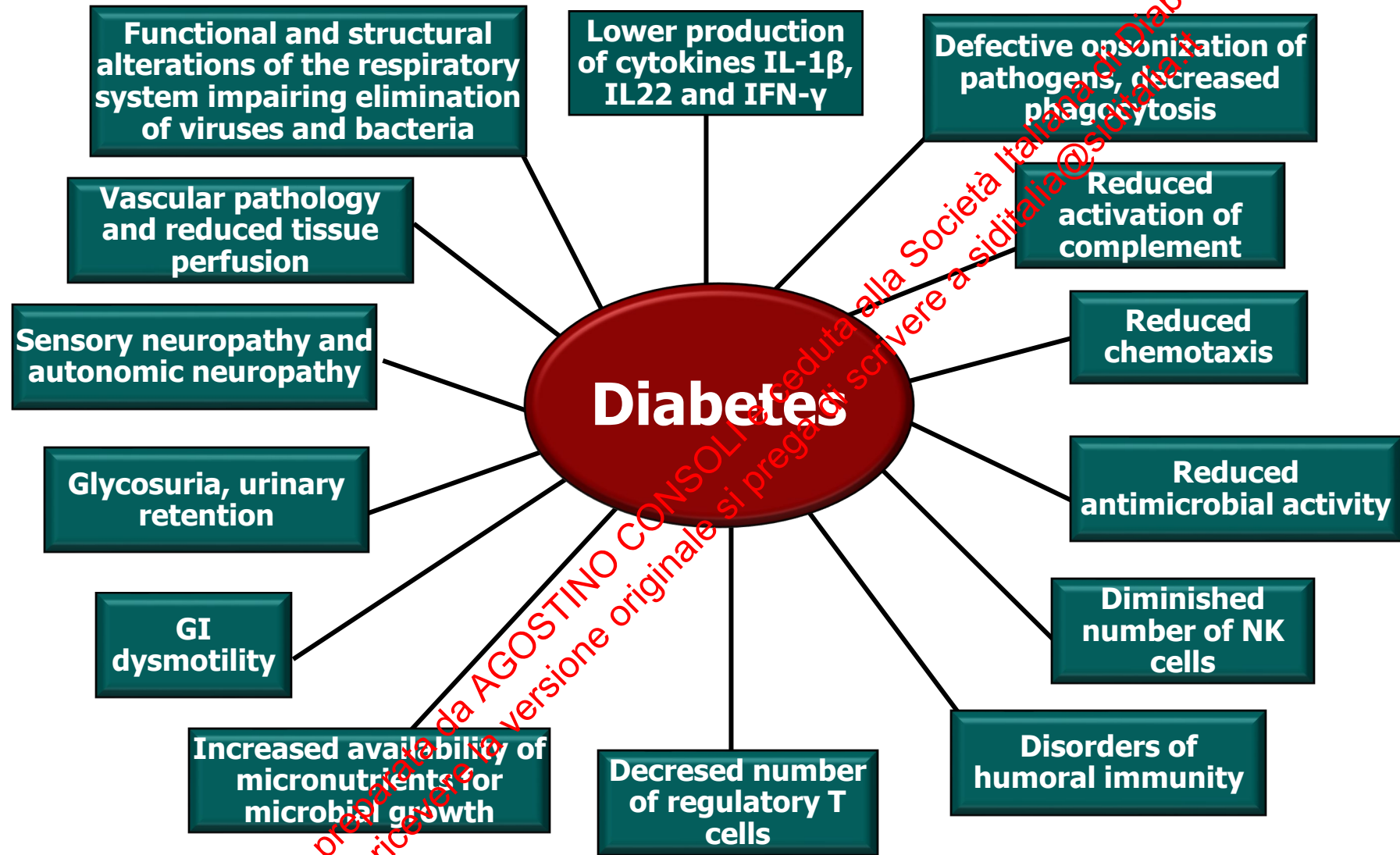
IRRs for hospitalization for infection during 2008–2015 between people with diabetes and matched control subjects



Risk ratios for the diabetic vs. the nondiabetic population for death attributable to infectious disease

A retrospective cohort study using administrative data compared all people with diabetes in Ontario, Canada, on 1 April 1999 to matched nondiabetic people (n=513,749 in each group)



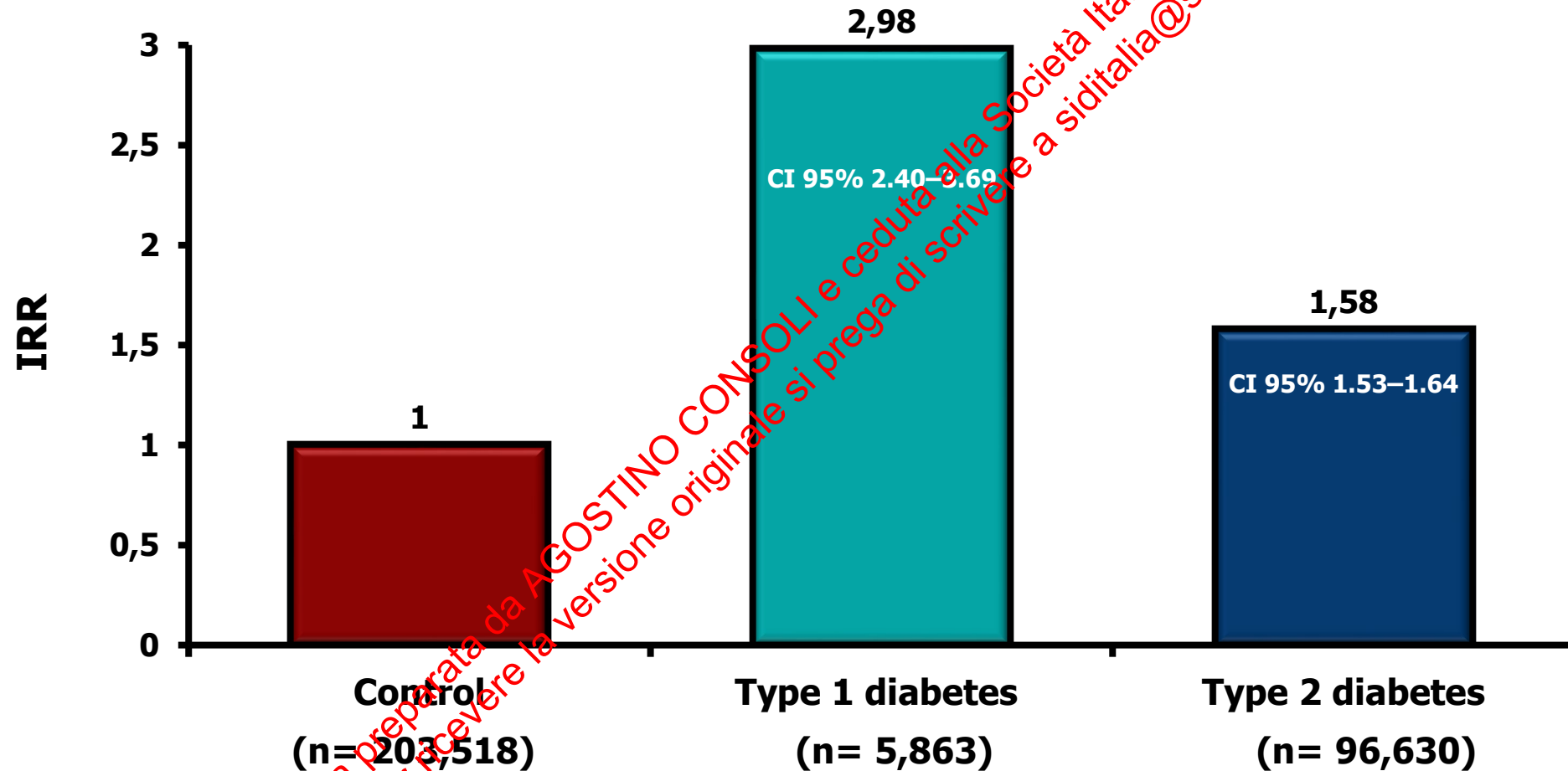


Bacterial Infections and Diabetes

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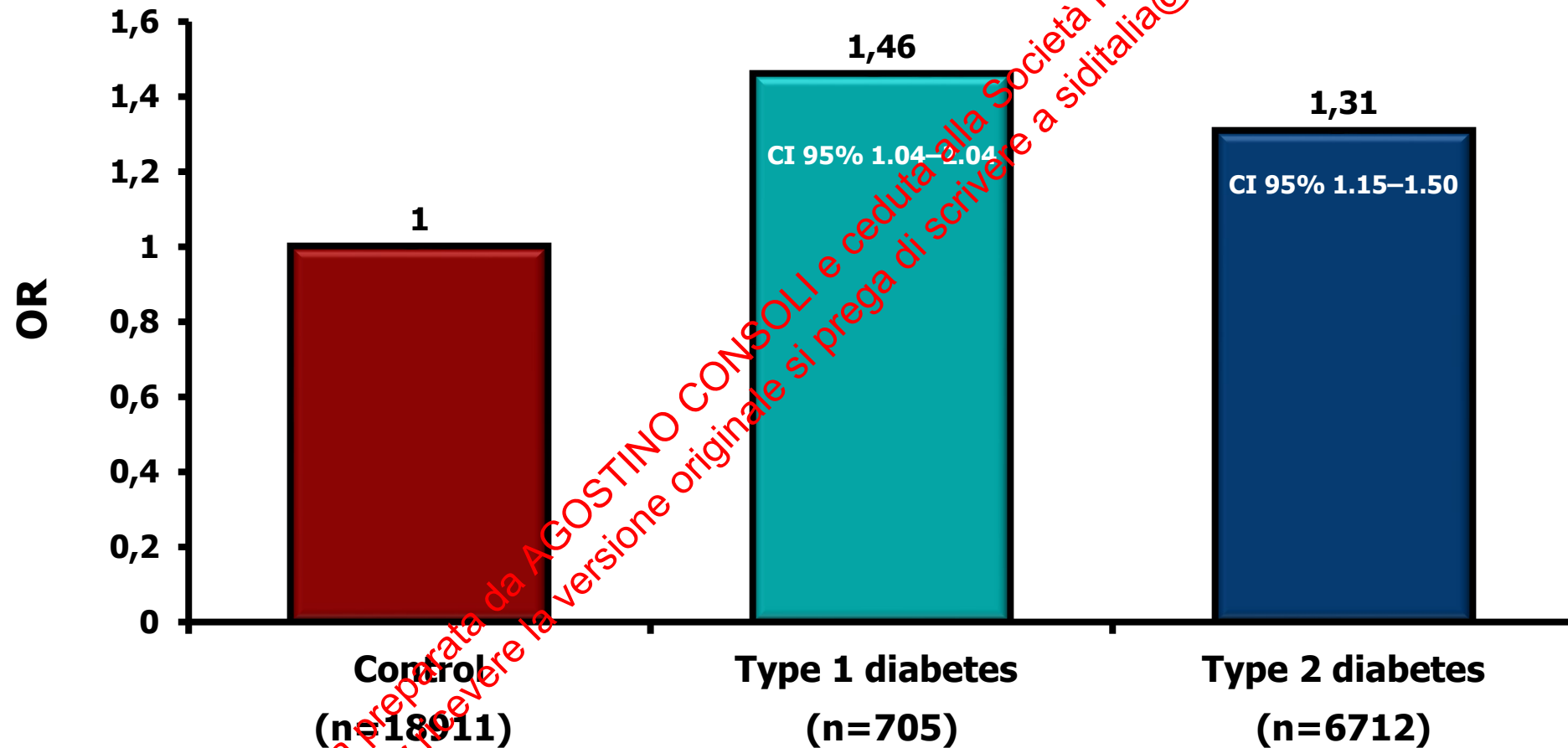
Incidence rate ratios (IRRs) of pneumonia among people with diabetes versus matched control subjects

A retrospective cohort study compared 102,493 English primary care patients aged 40-89 years with diabetes with age-sex-practice-matched non-diabetic control



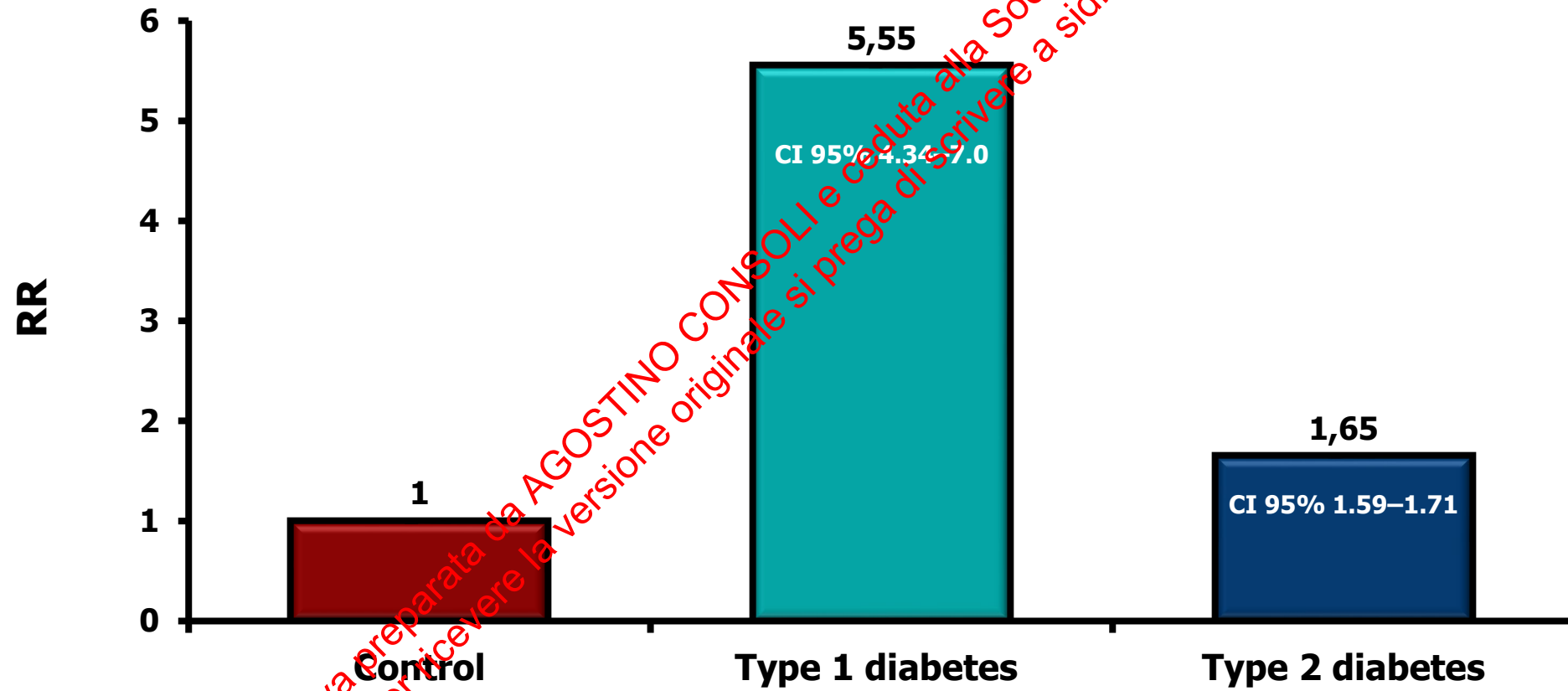
Unadjusted associations between diabetes mellitus and lower respiratory tract infections

A 12-month prospective cohort study conducted as part of the Second Dutch National Survey of General Practice



Relative risk (RR) for pneumonia-related hospitalization among subjects with and without diabetes

A population-based, case-control study of patients with a first-time pneumonia-related hospitalization between 1997 and 2005, using health care databases in northern Denmark. The study included 34,239 patients with a pneumonia-related hospitalization and 342,390 population control subjects

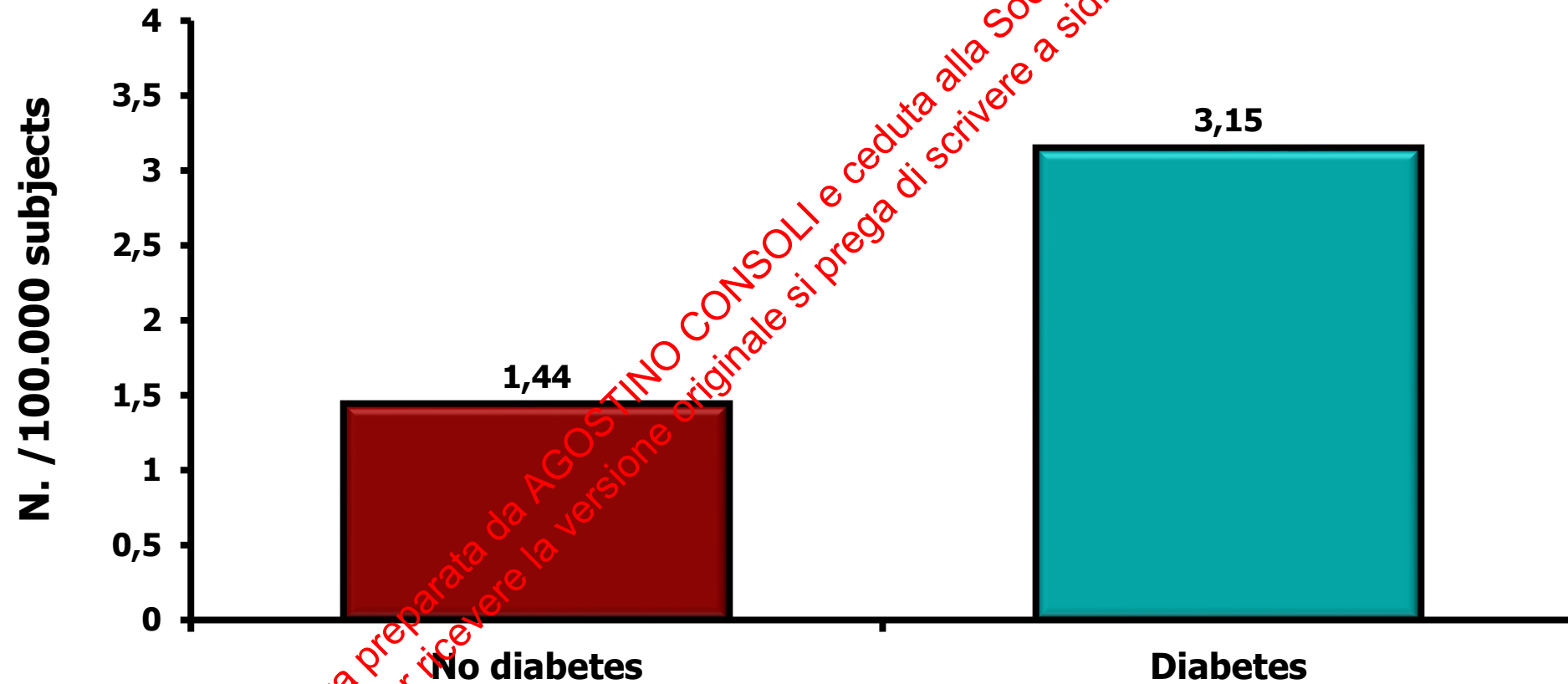


Primi 10 DRG in regime di ricovero ordinario

Osservatorio ARNO Diabete CINECA-Fondazione Res-SID – Rapporto 2019

Rank	DRG	Diagnosi principale	N. totale ricoveri	% su totale ricoveri	Δ % Casi vs Controlli	N. pazienti ricoverati (n=110.364)	ricoverati per 1000 diabetici (N=697.208)	% spesa	Spesa media per ricovero €	Durata media di degenza (gg)
1	127	Insufficienza cardiaca e shock	10.490	6,4	+55%	8.071	11,9	4,4	3.163	10,8
2	87	Edema polmonare e insufficienza respiratoria	9.827	6,0	+35%	7.705	11,1	4,7	3.662	11,7
3	316	Insufficienza renale	5.610	3,4	+113%	4.342	6,2	3,0	4.006	10,7
4	544	Sostituzione di articolazioni maggiori o reimpianto degli arti inferiori	3.467	2,1	-6%	3.175	4,6	4,3	9.504	9,3
5	14	Emorragia intracranica o infarto cerebrale	3.629	2,2	+19%	3.153	4,5	1,9	3.902	11,7
6	576	Setticemia senza ventilazione meccanica >= 96 ore, età' > 17 anni	2.409	2,1	+37%	2.979	4,3	2,3	5.144	15,3
7	89	Polmonite semplice e pleurite, età' > 17 anni con CC	1.977	1,8	+16%	2.615	3,8	1,4	3.634	12,9
8	125	Malattie cardiovascolari eccetto infarto miocardico acuto, con cateterismo cardiaco e diagnosi non complicata	2.744	1,7	+19%	2.566	3,7	0,9	2.366	4,7
9	557	Interventi sul sistema cardiovascolare per via percutanea con stent medicato con diagnosi cardiovascolare maggiore	2.481	1,5	+34%	2.252	3,2	2,8	8.616	10,0
10	558	Interventi sul sistema cardiovascolare per via percutanea con stent medicato senza diagnosi cardiovascolare maggiore	2.240	1,4	+47%	1.943	2,8	2,2	7.523	6,1

Prevalence of bacterial meningitis among subjects with and without diabetes in the Netherlands



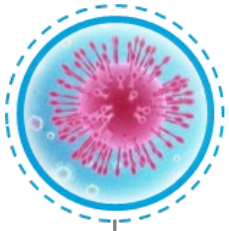
Evolving features and outcome of bacterial meningitis in diabetic patients

Characteristics	Diabetic Patients (n = 106)	Other Patients (n = 609)	P value
→ Systemic complications	48 (45.3)	184 (30.2)	0.024
→ • Acute respiratory failure	28 (26.4)	103 (16.9)	0.029
→ • Acute kidney failure	27 (25.5)	72 (11.8)	< 0.001
• Septic shock	19 (17.9)	88 (14.4)	0.376
• Disseminated intravascular coagulation	11 (10.4)	47 (7.7)	0.677
• Rhabdomyolysis	6 (5.7)	22 (3.6)	0.286
Outcome			
• Neurological sequelae	8 (7.5)	19 (3.1)	0.046
→ • In-hospital mortality	27 (25.5)	97 (15.9)	0.025

Viral Infections and Diabetes

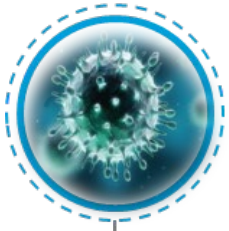
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Association between Diabetes and past Viral pandemics



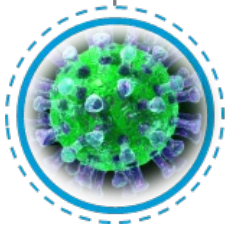
2003 Severe acute respiratory syndrome (SARS)

- ✓ Diabetes and hyperglycemia were independent risk factors for complications and death
- ✓ The percentage of patients with a known history of diabetes was significantly higher in the deceased patients than in the survivors (21.5% vs. 3.9%, $p < 0.01$)



2009 Influenza A (H1N1)

- ✓ The OR for ICU admission was 4.29 among hospitalized patients with diabetes compared to those without.

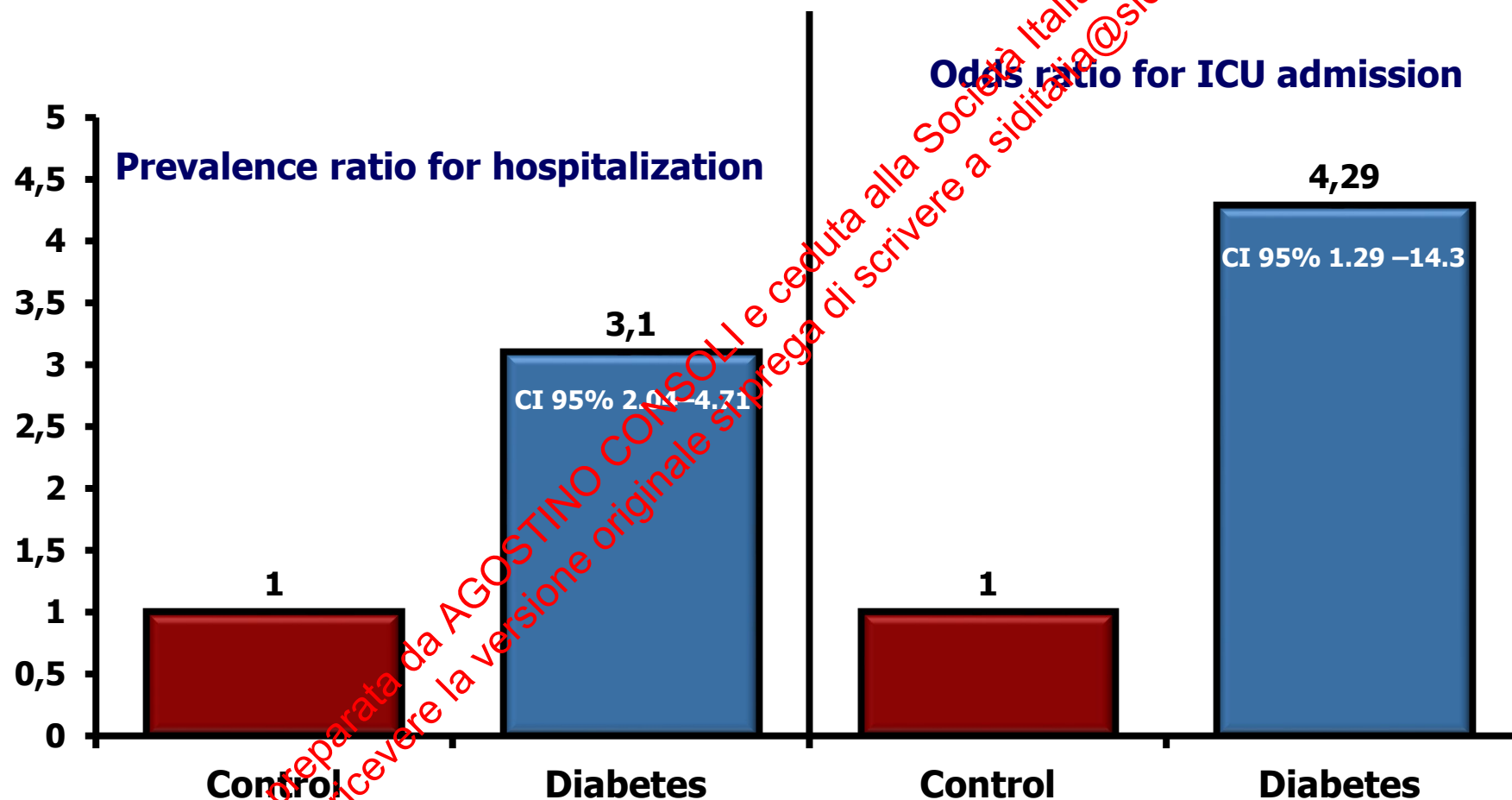


2013 Middle East respiratory syndrome (MERS)

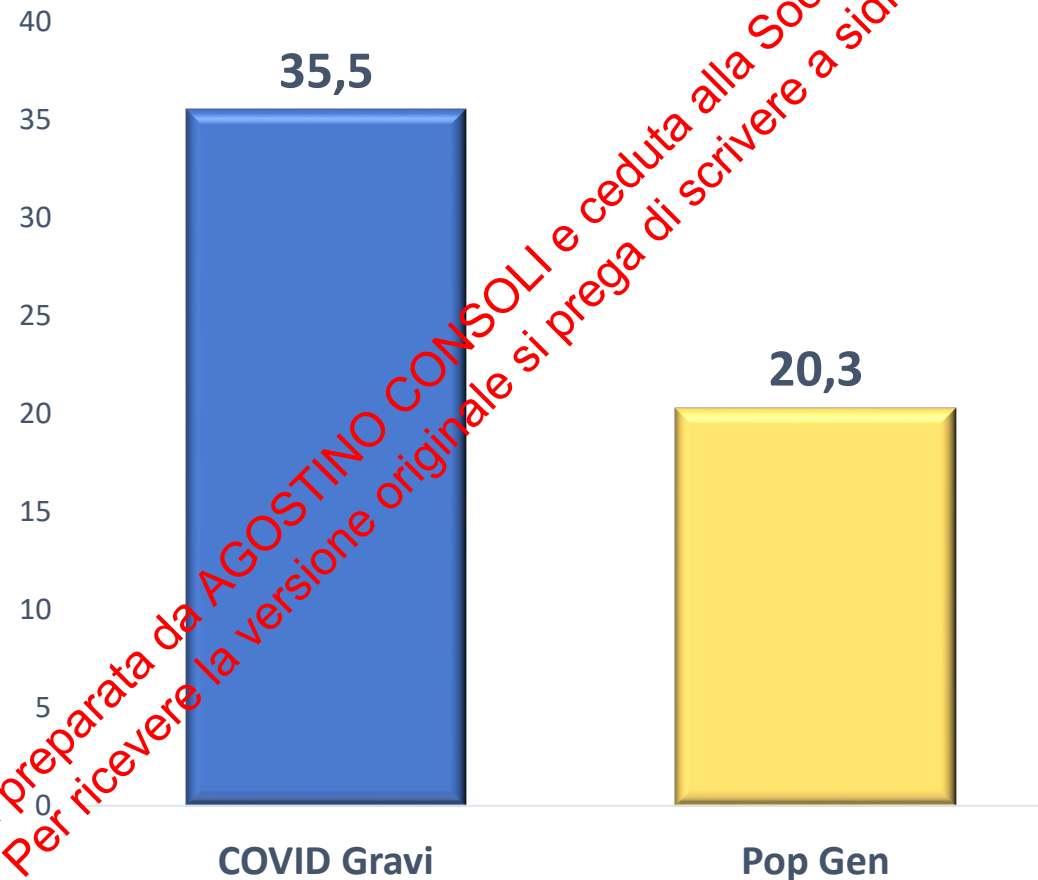
- ✓ Prevalence of diabetes was up to 51.8 in patients with MERS
- ✓ Diabetes was a clinical predictor of death (OR 1.8)

Diabetes and the severity of pandemic influenza A (H1N1) infection

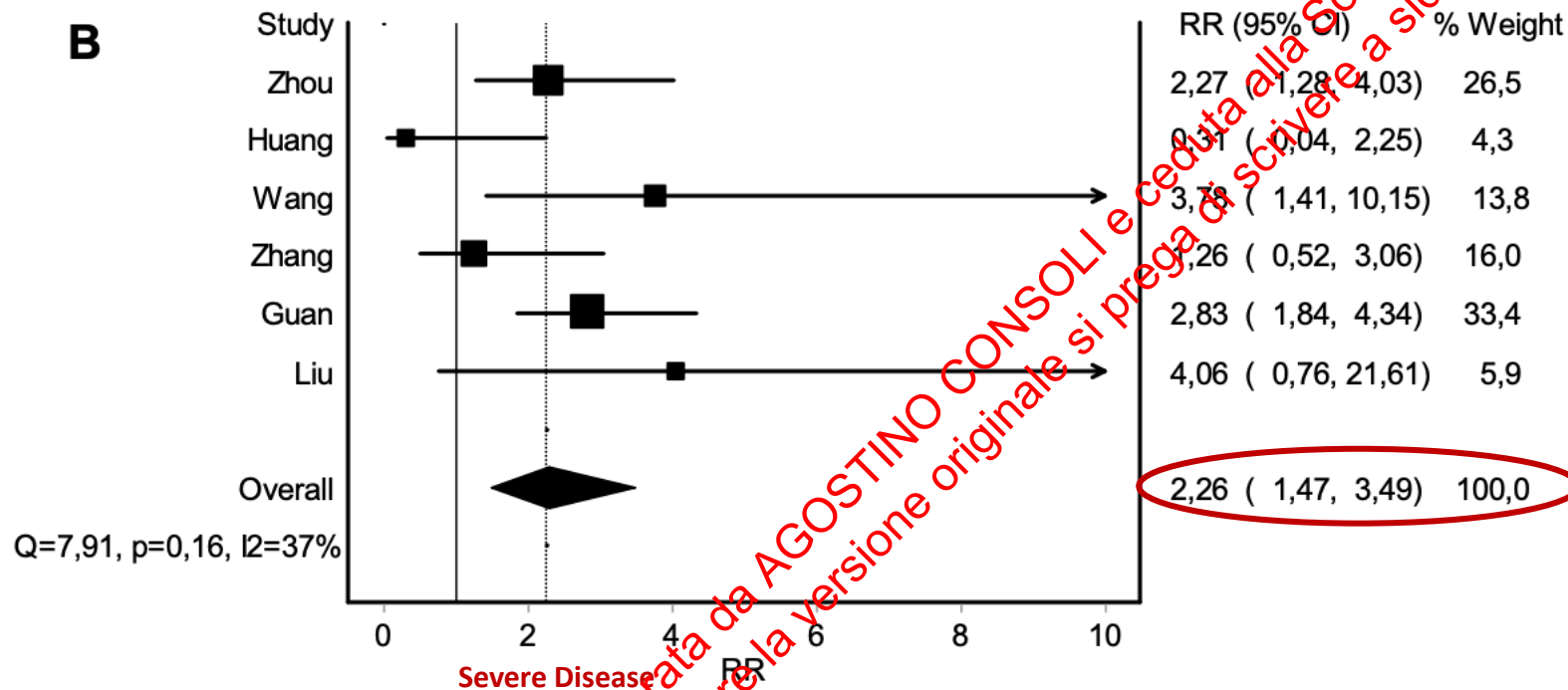
Data from an enhanced influenza surveillance project in Montreal, Canada analysing 239 subjects with a PCR-positive specimen for influenza A (H1N1)



Prevalence of Diabetes Mellitus among adverse outcome COVID patients and age matched general population in the Italian Region of Veneto.



Disease severity in diabetic patients with COVID-19



**Overall diabetes
rate ratio → 2.26**

Incidence Rates of Herpes Zoster by Diabetes

	Diabetic Individuals				Nondiabetic Individuals				Difference	
	Herpes Zoster Cases	Person-Years (PY)	Cases/1000 PY	95% Confidence Interval [CI]*	Herpes Zoster Cases	Person-Years (PY)	Cases/1000 PY	95% CI*	Incidence Rate Ratio	95% CI**
Total study population										
Enrollees in group	61 142	7 681 336	7.96	(7.90–8.02)	269 373	80 266 547	4.48	(4.46–4.49)	1.78	(1.76–1.79)
Sex										
Females	35 071	3 826 046	9.17	(9.07–9.26)	224 735	43 431 997	5.17	(5.15–5.20)	1.77	(1.75–1.79)
Males	26 071	3 855 290	6.76	(6.68–6.85)	134 638	36 834 550	3.66	(3.64–3.68)	1.85	(1.83–1.87)
Age group										
18–49 years	12 441	2 464 386	5.05	(4.96–5.14)	169 277	51 819 510	3.27	(3.25–3.28)	1.55	(1.52–1.57)
50–59 years	22 284	2 821 550	7.90	(7.79–8.00)	104 908	17 041 888	6.16	(6.12–6.19)	1.28	(1.26–1.30)
60–64 years	9619	993 601	9.69	(9.49–9.88)	31 838	4 396 777	7.24	(7.16–7.32)	1.34	(1.31–1.37)
≥65 years	16 798	1 402 349	11.98	(11.80–12.16)	53 350	7 008 371	7.61	(7.55–7.68)	1.57	(1.55–1.60)

Six-Month Rates of Persistent Post-Zoster Pain by Diabetes

	Herpes Zoster Cases		% Herpes Zoster Cases With Persistent Post-Zoster Pain				
	Diabetic Individuals	Nondiabetic Individuals	Diabetic Individuals		Nondiabetic Individuals		Difference
	N	N	%	95% Confidence Interval [CI]	%	95% CI	P Value*
Total study population							
Enrollees in group	44 460	264 397	5.67	(5.75–6.19)	3.93	(3.86–4.01)	<.01
Sex							
Females	25 569	165 776	6.12	(5.83–6.42)	4.07	(3.98–4.17)	<.01
Males	18 891	98 621	5.77	(5.44–6.11)	3.69	(3.57–3.81)	<.01
Age group							
18–49 years	7685	11 980	3.55	(3.16–3.99)	1.85	(1.77–1.93)	<.01
50–59 years	15 125	78 084	4.70	(4.38–5.05)	3.60	(3.47–3.73)	<.01
60–64 years	8862	32 200	5.26	(4.81–5.74)	4.69	(4.47–4.93)	.03
≥65 years	12 788	42 133	9.42	(8.92–9.93)	9.50	(9.22–9.78)	.80

Risk and consequences of herpes zoster infection in patients with diabetes mellitus

- DM represents an important risk factor for both herpes zoster and post-herpetic neuralgia and increases the severity of the clinical course of herpes zoster.
- T2DM increased the risk for persistent post-zoster pain by 18% and also zoster-related pain is more intense. Impaired glucose tolerance is also a risk factor for post-herpetic neuralgia.
- Patients with T2DM had more outpatient visits, were prescribed more antiviral agents and had higher risk for hospitalization and longer periods of sick leave. In addition, quality of life is worse in patients with T2DM following herpes zoster infection than in non-diabetic patients and improves more slowly. A worsening of glycemic control has been reported in patients with T2DM who are affected by herpes zoster.

Do vaccines work in Diabetes ?

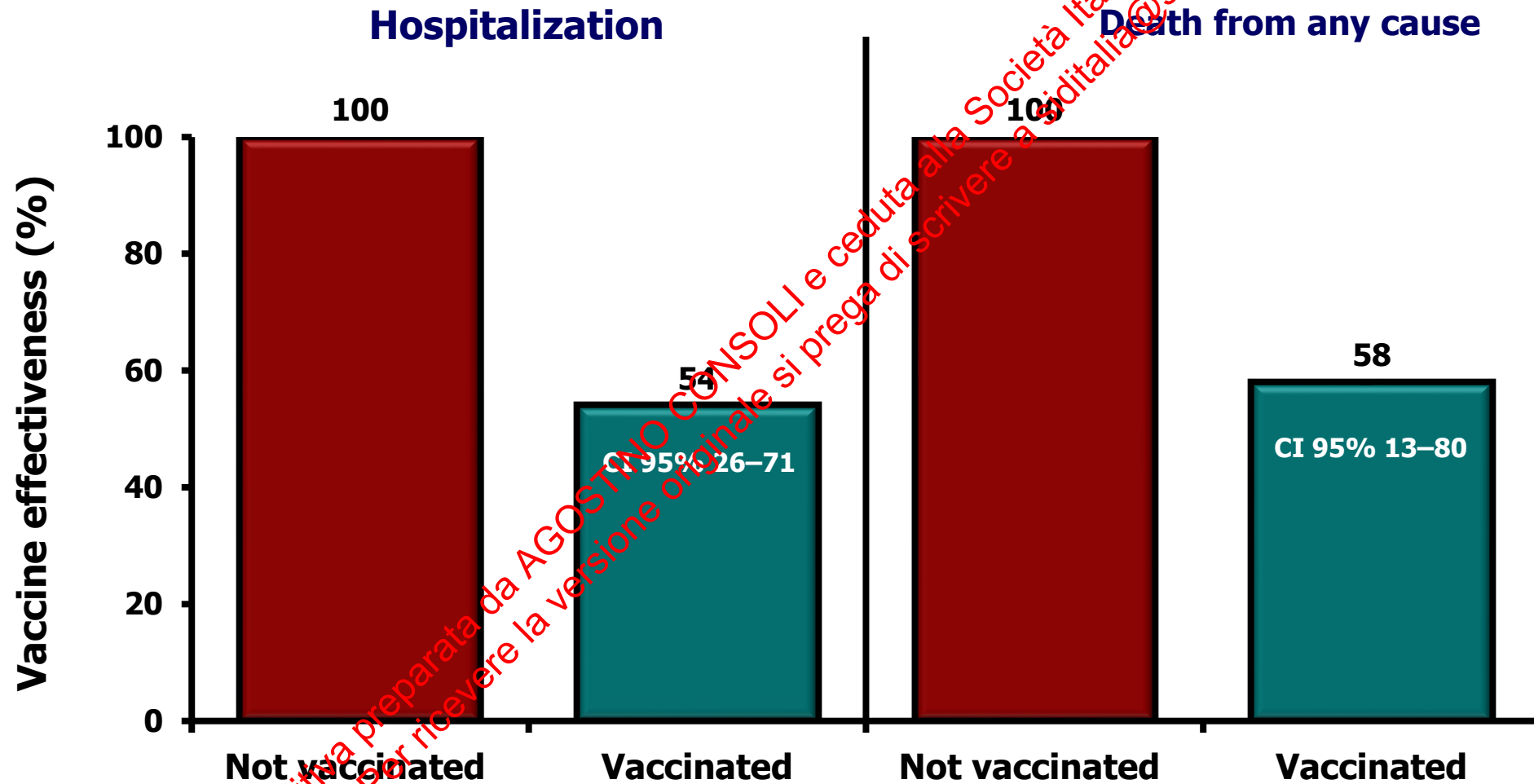
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Association of T2DM on the percentage of siero-protection and sieroconversion after anti-flu vaccination

Year 1	Diabetes	%Seroprotected	P-value	%Seroconverted	P-value
Strain					
A/Brisbane/59/2007	No	81.5	0.67	54.1	0.78
	Yes	76.1		54.9	
A/Brisbane/10/2007	No	76.1	0.36	55.6	0.88
	Yes	85.9		57.7	
B/Brisbane/60/2008	No	42.9	0.27	40.9	0.60
	Yes	42.3		40.0	
Year 2					
Strain					
A/California/7/2009	No	51.9	0.27	44.4	0.72
	Yes	46.0		44.0	
A/Perth/16/2009	No	80.3	0.21	56.7	0.47
	Yes	77.0		58.0	
B/Brisbane/60/2008	No	40.7	0.04	31.9	0.05
	Yes	29.0		24.0	

Influenza vaccine effectiveness in reducing morbidity and mortality during the 1999–2000 influenza A epidemic in individuals with diabetes (n= 9,238 adults)

The vaccine effectiveness was calculated as $(1 - OR) \times 100\%$



Multi-disciplinary Consensus Statement Document

Vaccinal prevention in adult patients with diabetes mellitus

SiTi, SID, AMD, SIMG, FIMMIG

Diabetes-treating physicians and GPs, during the collection of patients' history, should systematically assess and report within medical records, diabetic patients' vaccinal status regarding the following vaccinations:

- anti-flu;
- anti-pneumococcal;
- anti-diphtheria- tetanus-pertussis (dTp);
- anti-herpes zoster (HZ);
- anti-meningococcal (T1DM patients).

Multi-disciplinary Consensus Statement Document

Vaccinal prevention in adult patients with diabetes mellitus

SiTi, SID, AMD, SIMG, FIMMIG

Systematic vaccination counseling performed by diabetes-treating physicians must be implemented together with reporting, within either outpatient visit-associated documentation or hospital discharge-related letter (to be provided to diabetic patients) recommending to receive the following vaccinations:

- anti-flu;
- anti-pneumococcal;
- anti-dTp;
- anti-HZ;
- anti-meningococcal (T1DM patients).