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Global Influenza Hospital Surveillance Network

Assessment of 2012/13 IVE statistical heterogeneity across study sites within The Global Influenza Hospital Surveillance Network (GIHSN)

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Background, objectives

Multicentre IVE hospital based studies are needed to ensure sufficient sample sizes and generalisability of results. Validity of pooled datasets need to be assessed qualitative and quantitatively. Here we present the findings of statistical heterogeneity in IVE estimates across GIHSN participating sites for the 2012/13 season. **Forest plot #1**: Significant differences in site-specific (Valencia v other sites) estimates of IVE against influenza A hospitalization, but not against influenza B hospitalization.

UENZA B NOSPITAIIZATION. Strain / Studysite	Odds Ratio (95% CI)	influenza-positive / All vaccinated	influenza-positive/A non-vaccinated
Influenza A, B or both			
Valencia	0.82 (0.57, 1.19)	80 / 573	106 / 538
France	0.44 (0.26, 0.75)	51 / 204	97 / 223
ST Petersburg	0.56 (0.21, 1.48)	11/22	254/393
Moscow	0.56 (0.19, 1.64)	5/18	383 / 1004
Subtotal (I-squared = 20.9%, p = 0.285)	0.63 (0.45, 0.88)		
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Influenza A			
Valencia	1.52 (0.83, 2.78)	34 / 527	35 / 467
France +	0.35 (0.18, 0.67)	25 / 178	59 / 185
ST Petersburg	0.43 (0.13, 1.42)	7 / 18	168 / 307
Moscow	0.43 (0.11, 1.61)	3/16	289/910
Subtotal (I-squared = 74.6%, p = 0.008)	0.59 (0.25, 1.40)		
Influenza A H1N1			
Valencia	1.43 (0.76, 2.70)	29 / 522	34 / 466
France	0.19 (0.06, 0.62)	5 / 158	24 / 150
ST Petersburg	0.37 (0.08, 1.59)	4/15	99 / 238
Moscow	0.17 (0.02, 1.40)	1/14	220/841
Subtotal (I-squared = 75.1%, p = 0.007)	0.42 (0.12, 1.43)		
Influenza A H3N2			
Valencia	2.49 (0.24, 25.53)	4 / 497	1 / 433
France	0.44 (0.20, 0.97)	17 / 170	29 / 126
ST Petersburg	0.36 (0.06, 2.23)	2/13	49 / 188
Moscow 🔹	0.88 (0.09, 8.53)	1/14	56 / 677
Subtotal (I-squared = 0.0%, p = 0.514)	0.52 (0.27, 1.01)		
Influenza B			
Valencia	0.60 (0.38, 0.95)	46 / 71	71 / 503
France	0.54 (0.26, 1.11)	26 / 179	38 / 164
ST Petersburg	0.60 (0.16, 2.25)	4/15	93 / 232
Moscow	1.01 (0.19, 5.21)	2/15	95 / 716
Subtotal (I-squared = 0.0%, p = 0.923)	0.60 (0.42, 0.86)		
Overall (I-squared = 39.5%, p = 0.037)	0.61 (0.47, 0.78)		

Methods

Individual patient data from Spain (5 hospitals), Russia (4 hospitals) and France (5 hospitals) was used to estimate both pooled and site specific IVE in patients ≥ 18 by using a hospital based test negative design. Heterogeneity in the estimates was assessed by using the Cochran's Q test and the I² statistics (Stata v.12).

Results

Study population:

Records screened :

N=9150 (Sp N=5038; STPet N=1986; Mosc N=1677; Fr N=449)

Forest plot #2: site-specific differences in IVE estimates against influenza A were explained by varying confounding effects of comorbidity across sites. IVE estimates against influenza B were affected by baseline comorbidity to a lower degree.

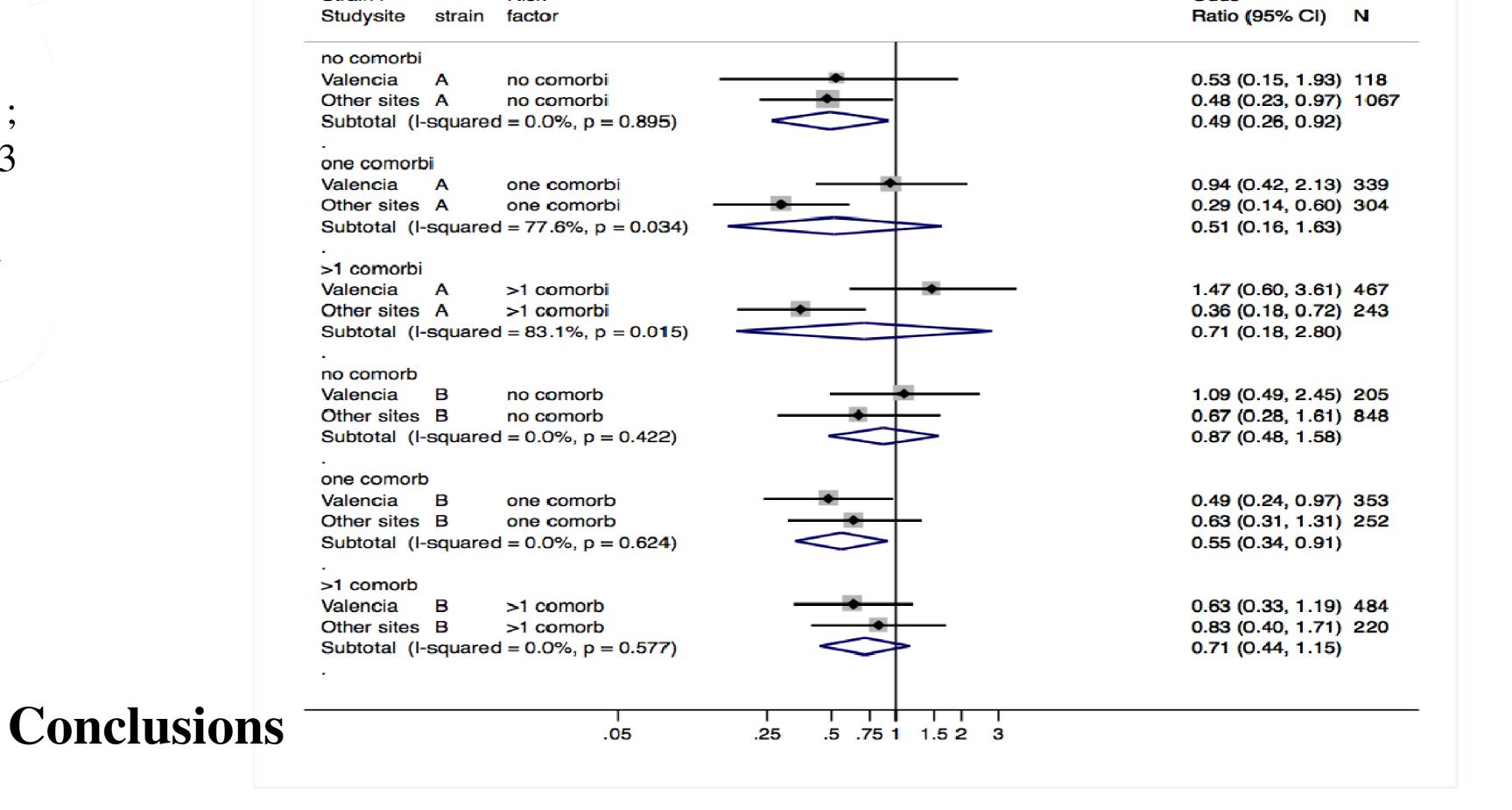
Records excluded:

Non-resident N=63 ;Institutionalized N=357; No consent obtained N=632 ; Less than 18years N=1923 ; No meeting ILI case definition within 2012/13 season N=2917 ; Hospitalized <30 days ago N=54 ; ILI onset outside the influenza season N=839; Positive lab results for influenza virus during the season N=3 ; Contraindication against vaccination N=11; Missing data: N=215

Records included in the analyses *influenza-free,** influenza A or B, or both, ***vaccinated >14 days from sysmptoms onset

Study site		Vaccination 2012/13***		Total	
		No n(%)	Yes n(%)	n	
Valencia	Control*	432(46,7%)	493(53,3%)	925	
	Case**	106(57%)	80(43%)	186	
St Petersburg	Control	139(92,7%)	11(7,3%)	150	
	Case	254(95,9%)	11(4,2%)	265	
Moscow	Control	621(98%)	13(2,1%)	634	
	Case	383(98,7%)	5(1,3%)	388	
France	Control	126(44,8)	153(54,5%)	279	
	Case	97(65,5%)	51(34,5%)	148	
Total	Control	1318 (61,1%)	840(38,9%)	1988	
	Case	670(82%)	147(18%)	987	

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Risk group specific -IVE against influenza A hospitalization needs to be presented, and random effects models used in the pooled analyses.

Larger samples sizes and an informed pooling, by a thorough assessment and exploration of heterogeneity, should allow for obtaining precise risk group-specific IVE estimates.