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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.

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 I^2 statistics (Stata v.12).

Results

Study population:

Records screened :

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

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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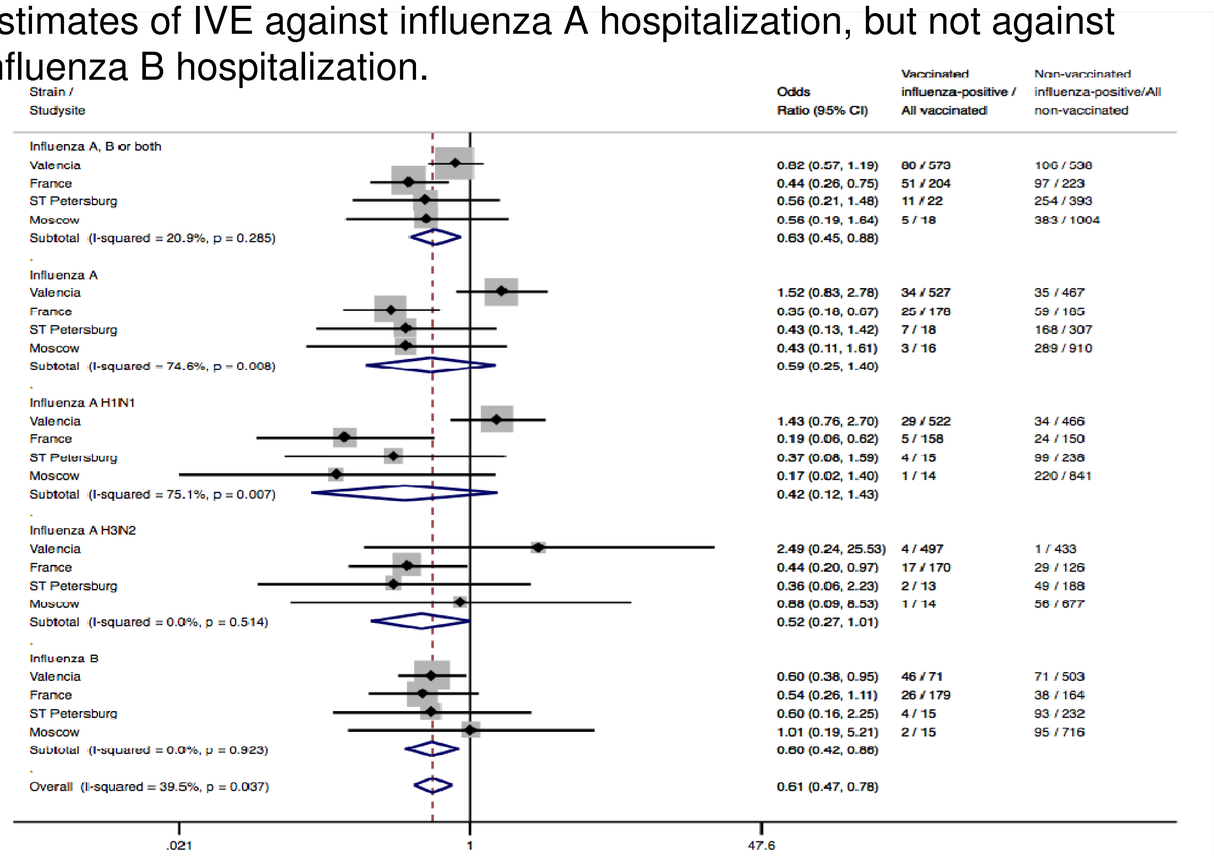
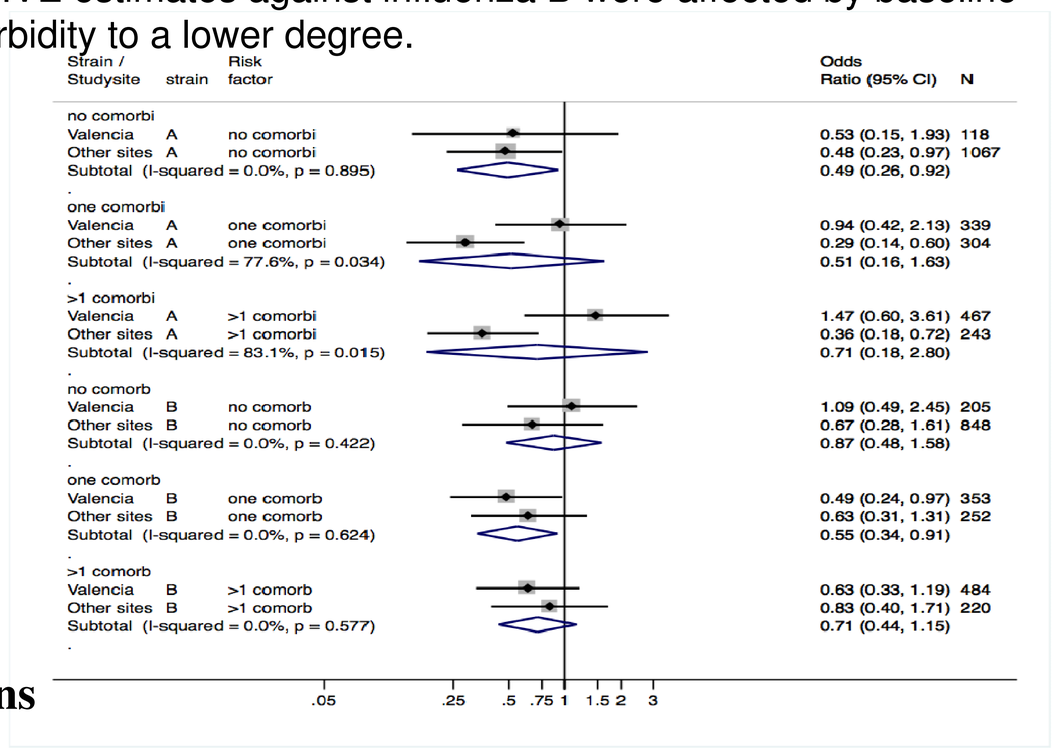
Forest plot #1: Significant differences in site-specific (Valencia v other sites) estimates of IVE against influenza A hospitalization, but not against influenza B hospitalization.



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.



Conclusions

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.