PERFORMANCE OF ECDC ILI CASE DEFINITION AND ICPC R80 CODE FOR INFLUENZA SURVEILLANCE

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INTRODUCTION

Swift and accurate identification of influenza-like illness (ILI) using a reliable case definition for surveillance can reduce epidemic-related mortality, morbidity and economic burden.

The impact depends on the **virus subtype**, **age group** and **vaccination status**.

In this study we took advantage of the Portuguese Influenza Surveillance Systems (ISS) database to assess and compare the performance of the two main case definitions used in Portugal: the European Centre for Disease Prevention and Control (**ECDC**) ILI case definition and the International Classification of Primary Care (**ICPC**) R80 code.

On a second phase, we studied the **clinical factors** associated with the **laboratory confirmed diagnosis** of influenza.

Table 1. Differences between case definitions

ECDC ILI	ICPC R80
Sudden onset of symptoms **And** at least one of the following: • Fever or feverishness • Malaise • Headache • Myalgia **And** at least one of the following: • Cough • Sore throat • Shortness of breath	Myalgia **And** Cough **And** Sore throat **And** at least **three** of the following: • Sudden onset of symptoms • Fever or feverishness • Malaise • Close contact with infected people or during epidemic

METHODS

We conducted a retrospective, observational cross-sectional study using the ISS database of 6,616 cases with individual **clinical symptoms** of both case definitions, **vaccination status** and a **nasopharyngeal swab** result with virus subtype collected between October 2010 and April 2017.

The performance of both case definitions were assessed by their **sensitivity**, **specificity** and area under the receiver operating characteristic curve (**AUC**). We tested the association between a positive result for influenza and sex, vaccination status and clinical symptoms stratified by age group using multiple logistic regression.

A 0.05 significance level was accepted, statistical analysis was performed with STATA v14.0.

RESULTS

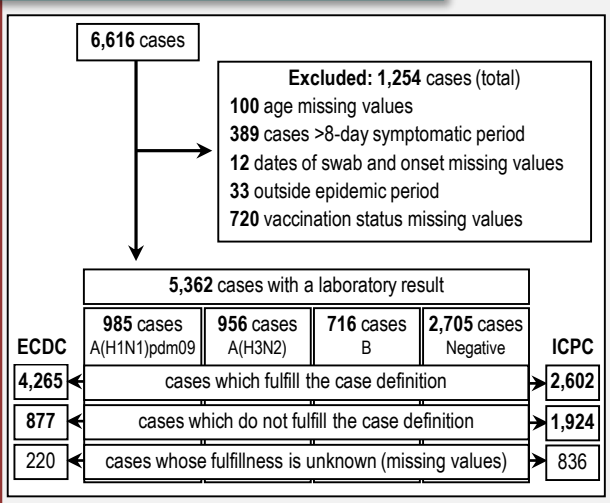

Fig 1. Flow diagram. ECDC: European Centre for Disease Prevention and Control. ICPC: International Classification of Primary Care.

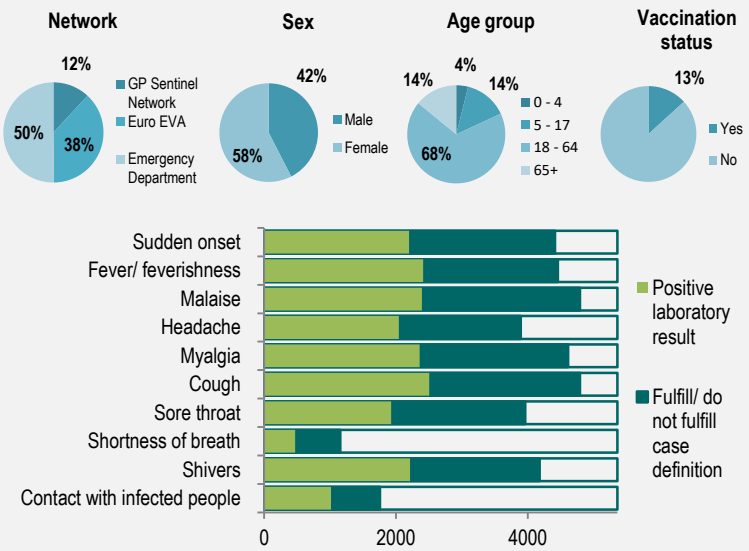

Fig 2. Cases with positive laboratory results by network, sex, age, vaccination status, clinical symptoms and case definition, Portuguese Influenza Surveillance System, 2010-2017.

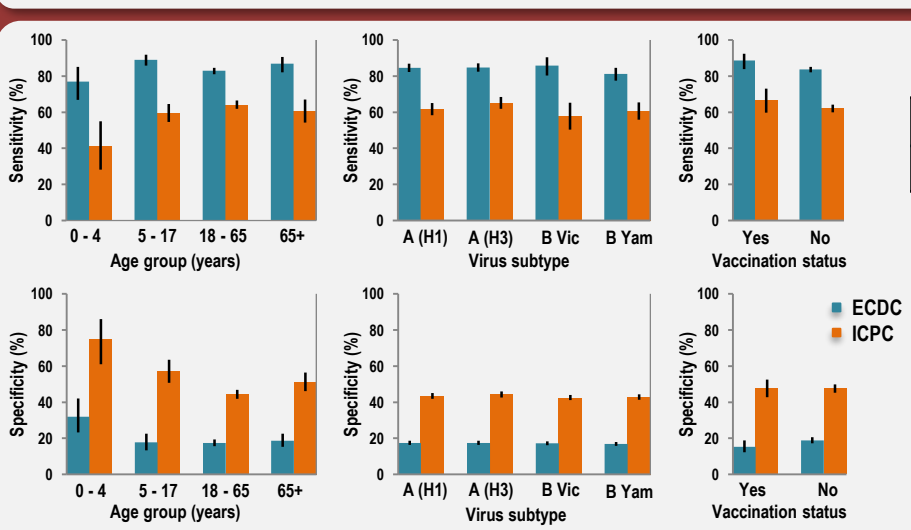

Fig 3. Sensitivity and specificity of ECDC ILI (blue) and ICPC R80 code (orange) case definitions, stratified by age group, virus subtype and vaccination status, Portuguese Influenza Surveillance System, 2010-2017.

Table 2. Area under the receiver operating characteristic curve (AUC) of ECDC ILI case definition and ICPC R80 code

Case definition	ECDC ILI %	ECDC ILI (95% CI)	ICPC R80 %	ICPC R80 (95% CI)
AUC	**0.512**	(0.502-0.522)	**0.551**	(0.536-0.565)

- **No significant difference** between the AUC of both case definitions.
- No significant association between **sex** and influenza positive laboratory result.
- Being **vaccinated** was associated with influenza positive laboratory result (OR **0.44**; 95%CI 0.37-0.51)
- **Clinical symptoms** significantly most associated with influenza positive laboratory result were:
  - fever/ feverishness (OR **4.16**; 95%CI 3.38-5.12)
  - cough (OR **3.17**; 95%CI 2.57-3.90)
  - shivers (OR **1.98**; 95%CI 1.71-2.28)

CONCLUSION

In the current effort to halt epidemic-related mortality, morbidity and economic burden, we suggest using the **most sensitive case definition** complemented with a **specific laboratory test** since epidemiological and clinical criteria per se are not accurate enough to predict influenza infection.

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