Surveillance of acute respiratory infections through usage of emergency department data

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BACKGROUND

Acute respiratory infections (ARI) may lead to increased hospitalization and excess mortality during the annual flu epidemic. Besides laboratory surveillance of influenza, syndromic surveillance of ARI in Germany is based on reports of primary care physicians (e.g. ICD-10-GM coded diagnoses). Hospitalization rate is likely to be under-estimated as severe cases may consult an emergency department (ED) directly. The joint research project for establishing a German emergency department data registry (AKTIN) is evaluating a decentralized approach to access data routinely recorded and stored in EDs.

We investigated if the flu season 2014/2015 can be shown on the basis of ICD-coded data from one of our project hospital's ED.

METHODS

We included all patients in our analysis that were hospitalised after attending the emergency department of Wolfsburg (WOB) hospital between calendar weeks (CW) 27/2014 and CW 26/2015. An ARI was defined if the following ICD-10-Codes were recorded as admission diagnosis: J00 to J22 (including subgroups), J44.0 and B34.9. Reference data were retrieved from public health databases on a regional (laboratory surveillance) and national (ICD-coded data from primary care physicians) level. We calculated absolute and relative frequencies and compared epidemic curves, age distribution and distribution of ICD-10-codes.

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RESULTS

14,106 patients were hospitalised during the observed period. 535 cases of these (3.8%) were diagnosed with an ARI, on average 10 admissions per week due to an ARI respectively. The number of cases was rising at the beginning of 2015 and reached its peak in CW 10/2015, when 25 patients (9.5%) were hospitalized. Compared with reference data there was a graphical correlation of the epidemic curves (Fig.1). Mean age of ARI-cases was 71.7 years (SD ± 16.2; median 76). Most common diagnoses were J18 (pneumonia, 61.1%), J15 (bacterial pneumonia, 13.5%), J44.0 (COPD with acute lower respiratory infection, 12.3%) and J20 (acute bronchitis, 7.9%). Patients in our sample were older and distribution of diagnoses differed from reference data.
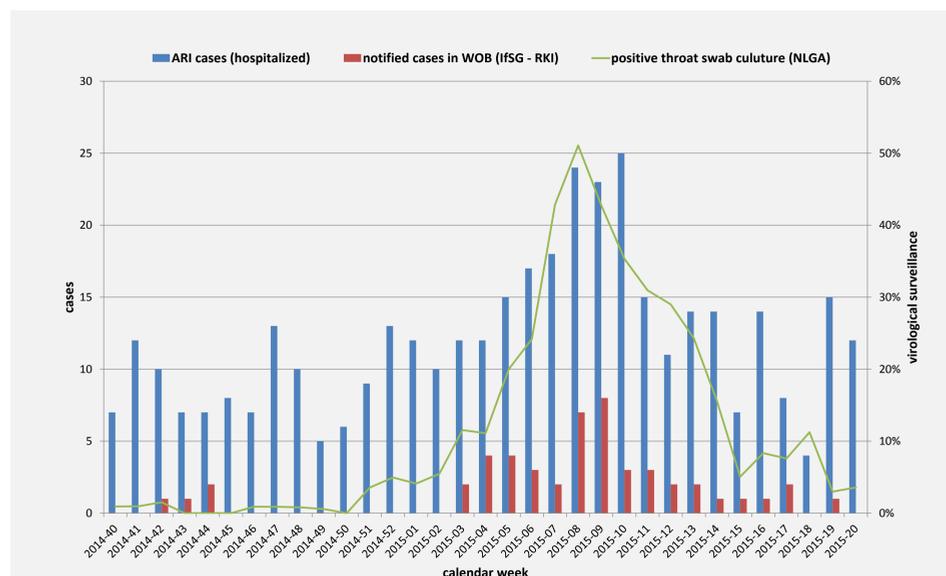

Fig. 1: Comparison of hospitalized ARI cases with virological surveillance

DISCUSSION

Our analysis shows that the course of the flu season 2014/2015 can also be depicted on the basis of ICD-10-Codes recorded in an emergency department. The current and well-established ARI surveillance is based on data from laboratories and primary care physicians. So far hospital data is not included in syndromic surveillance, even though data from EDs may provide additional information about the epidemiological situation of ARI regarding more severe cases.
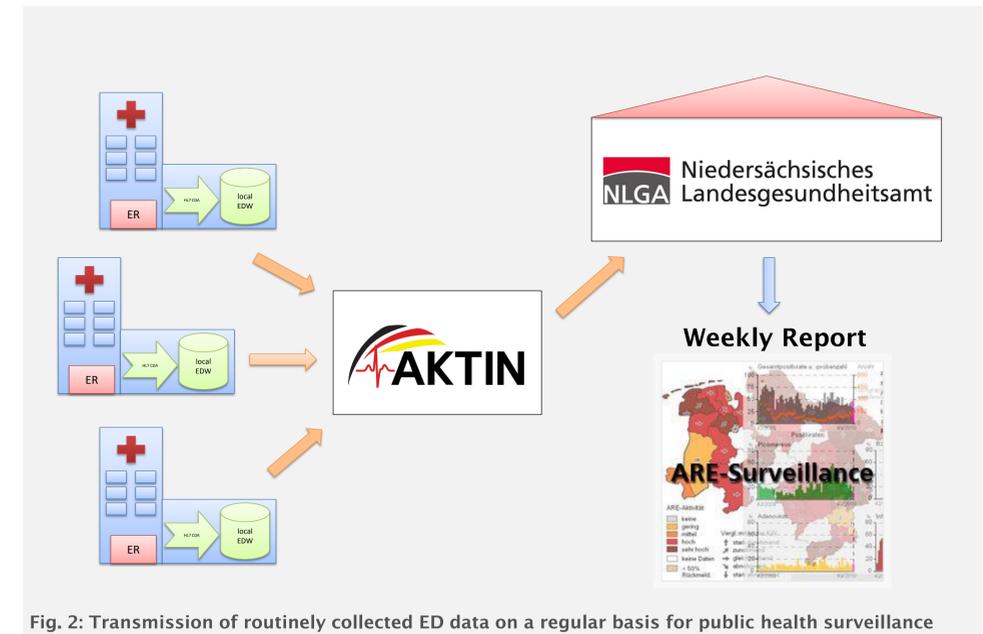

Fig. 2: Transmission of routinely collected ED data on a regular basis for public health surveillance

OUTLOOK

Part of the AKTIN-Project is the evaluation of routinely collected ED data for public health surveillance. This includes the investigation of presenting complaints and ICD-10-diagnoses as a steady information stream to public health authorities (Fig. 2).