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Transferability of health economic evidence: a quantitative country comparison of Acute Respiratory Infection and Influenza-like-Illness incidence

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Objective

Community-acquired acute respiratory tract infections (CA-ARTI) are a common reason for primary care consultations (1,2). The cost-effectiveness management of CA-ARTI is helped by health economic analyses. However, analysis inputs may vary by country. The current study examines the transferability of a health economic model across countries within the European Economic Area (EEA) by focusing on incidence of acute respiratory infections (ARIs) and Influenza-like-Illness (ILI).

Main findings

Season 2018-2019 was selected in the current analysis as the most recent season before the COVID-19 pandemic. Incidence of ARI and ILI was available for fourteen countries. Four different clusters were determined based on growth, decline, and peak.

- Cluster 1 represented countries with a relatively moderate growth rate and incidence peak;
- Cluster 2 represented countries with a relatively low growth rate and incidence peak;
- Cluster 3 (Portugal and Ireland) had a high growth and decline rate but a relatively low incidence peak;
- Cluster 4 (Slovakia) was different from cluster 1 due to incidence peak.

Age-specific incidence was available for six countries. Clusters were determined with less distinction, compared to the non-age clustering. Clusters per age group are shown in table 2.

Table 2: *Clusters of countries of ARI-ILI incidence by age group.*

Country	Age 0-4	Age 15-64	Age 5-14	Age 65+
Belgium	1	1	1	1
Czechia	1	1	2	1
Netherlands	1	2	2	2
Romania	2	2	2	2
Slovenia	1	2	2	1
Slovakia	1	1	1	1

Methods

Age-specific weekly incidence of ARI and ILI from EEA countries (n=27) in the period 2010 - 2023 were requested from The European Surveillance System (TESSy) of the European Centre for Disease Control (ECDC). Weekly incidence of ARI and ILI was calculated per 100,000 population and grouped by country, season (splitting at week 35), and age group (ages 0-4, 5-14, 15-64, 65 and older). Incidence models were created for countries with complete seasons available. Hierarchical clustering of countries was applied with agglomeration method 'ward' on growth rate, decline rate, and peak (i.e. highest incidence per season).

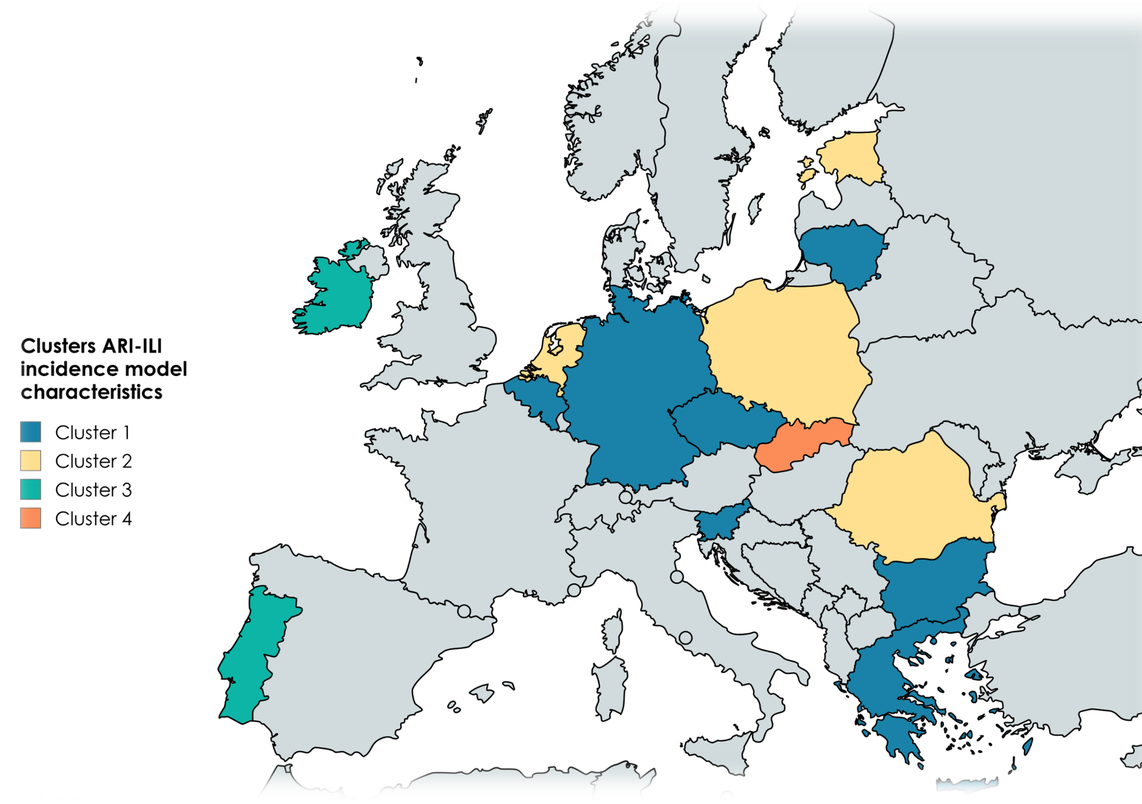
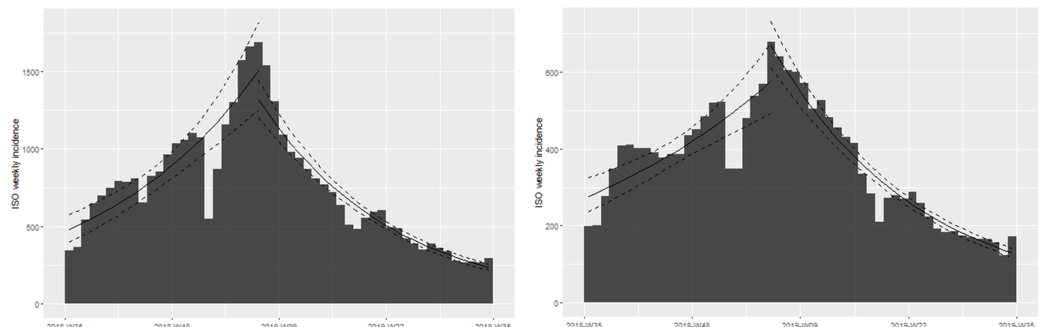
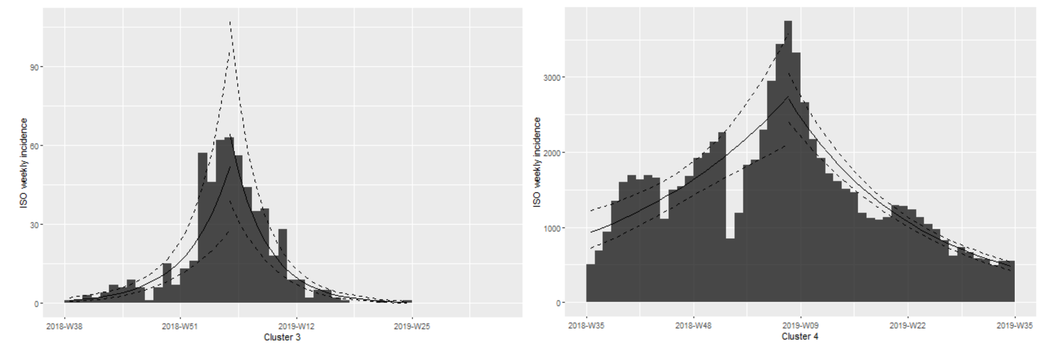


Figure 1: *Clusters of countries by model characteristics of acute-respiratory infection and influenza-like illness incidence.* ***Table 1:*** *growth rate, decline rate, and incidence peak per cluster of countries.*

	Cluster 1	Cluster 2
Mean growth (rate)	0.0078	0.0053
Mean decline (rate)	-0.0096	-0.0091
Mean peak (incidence per 100,000)	1,925	732
No. countries	7	4



	Cluster 3	Cluster 4
Mean growth (rate)	0.0252	0.0064
Mean decline (rate)	-0.0270	-0.0091
Mean peak (incidence per 100,000)	69	3,743
No. countries	2	1



Conclusion

The results presented here deepen the understanding of ARI-ILI incidence across Europe and may be of use in transferring health economic models. Further research should focus on correlated factors to the different incidence patterns of ARI and ILI in Europe and account for multiple seasons.

References: 1.NHS England » Combined adult and paediatric acute respiratory infection (ARI) hubs [Internet]. [cited 2024 Oct 15]. Available from: https://www.england.nhs.uk/long-read/combined-adult-and-paediatric-acute-respiratory-infection-ari-hubs/; 2. Schneider JE, Boehme C, Borisch B, Dittrich S. Application of a simple point-of-care test to reduce UK healthcare costs and adverse events in outpatient acute respiratory infections. Journal of Medical Economics. 2020 Jul 2;23(7):673–82.

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