

Summary of testing phase German flu forecasting results

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Overview

This document summarizes the performance of time-series forecasting models developed by UMass-Amherst Biostatistics PhD students for a PhD Seminar. The goal was to create forecasting models that accurately forecasted influenza incidence in Germany. We used as the gold-standard data a time series obtained from the Robert Koch Institut (RKI), a national public health agency in Germany. The testing dataset is shown below.

Results across all regions

model	avg_bias	ci50_cov	ci80_cov	ci90_cov
DL4EPI	-1.51	0.49	0.61	0.64
hetGP	-2.69	0.42	0.76	0.80
SIRS_EAKF	-3.46	0.08	0.24	0.32
sarimaTD	-4.13	0.47	0.75	0.82

Average bias by region

location	DL4EPI	hetGP	SIRS_EAKF	sarimaTD
Baden-Württemberg	-1.19	-1.64	-1.42	-2.32
Bavaria	0.03	-2.05	-2.70	-3.23
Berlin	-1.26	-1.80	-2.10	-3.22
Brandenburg	-0.29	-2.79	-3.25	-4.36
Bremen	-0.62	-0.58	-0.16	-0.92
Hamburg	-2.85	-3.26	-3.75	-5.00
Hesse	0.25	-1.45	-0.85	-1.87
Lower Saxony	2.31	-1.18	-0.61	-1.72
Mecklenburg-Vorpommern	-6.12	-4.41	-7.93	-7.13
North Rhine-Westphalia	-1.44	-1.58	-1.00	-2.06
Rhineland-Palatinate	-1.63	-2.48	-2.35	-3.47
Saarland	-0.91	-0.95	-0.49	-1.38
Saxony	-3.04	-5.62	-9.48	-9.13
Saxony-Anhalt	-3.35	-7.20	-10.91	-10.29
Schleswig-Holstein	-2.13	-2.35	-1.82	-3.08
Thuringia	-1.92	-3.63	-6.54	-6.82

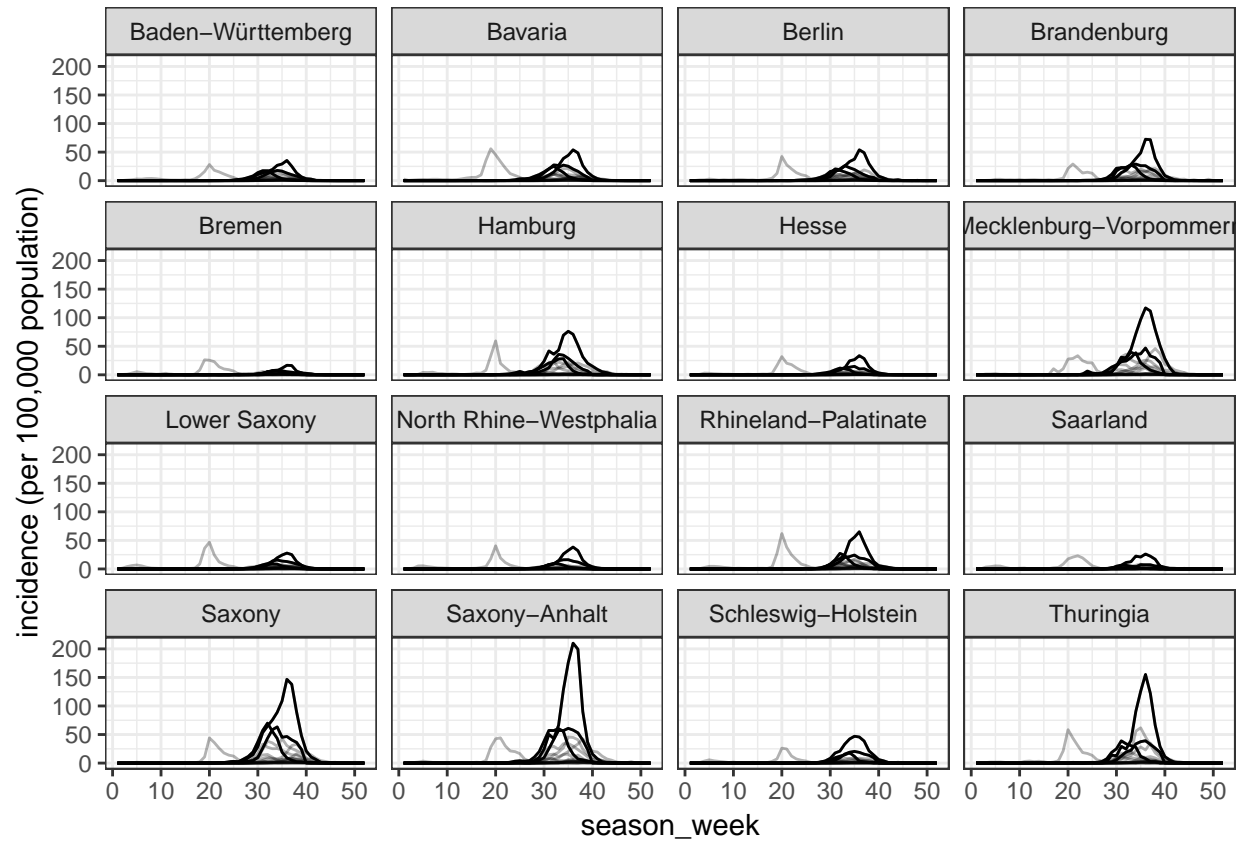


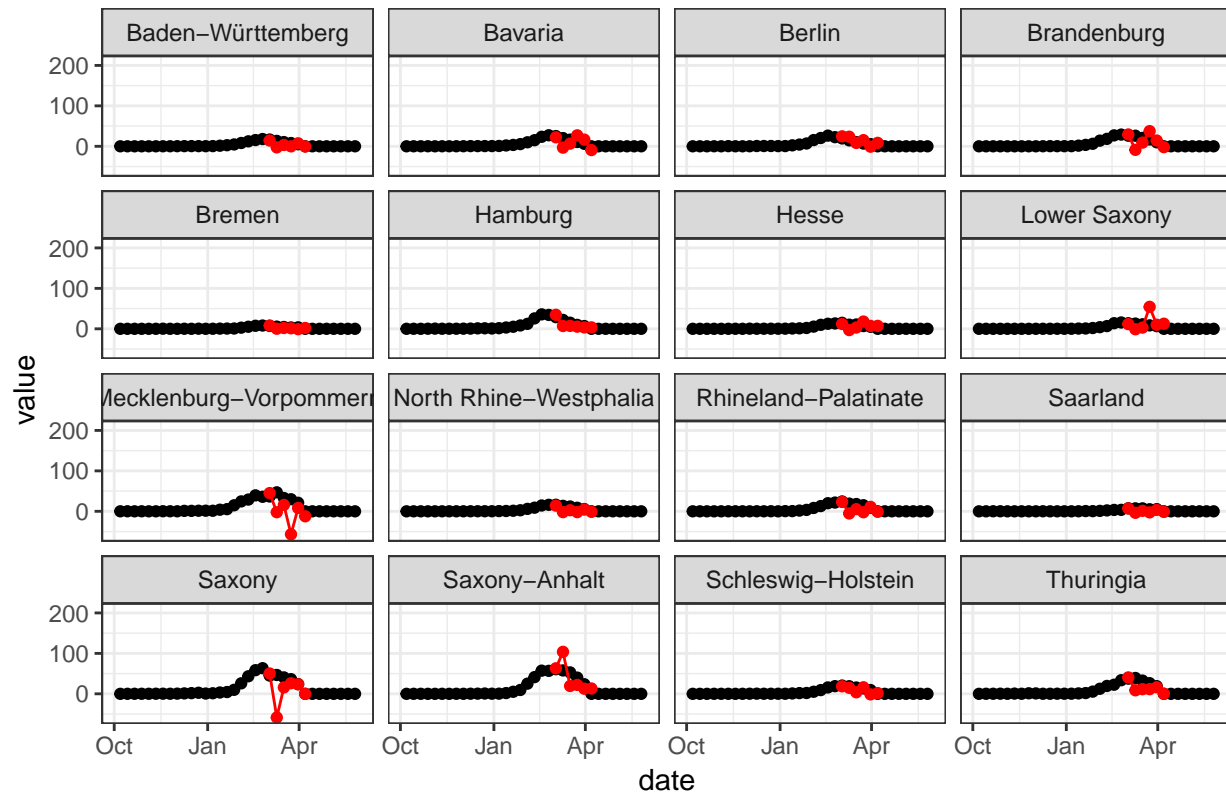
Figure 1: All data, stratified by state, with the three seasons evaluated for testing showed in darker color

Average bias by target

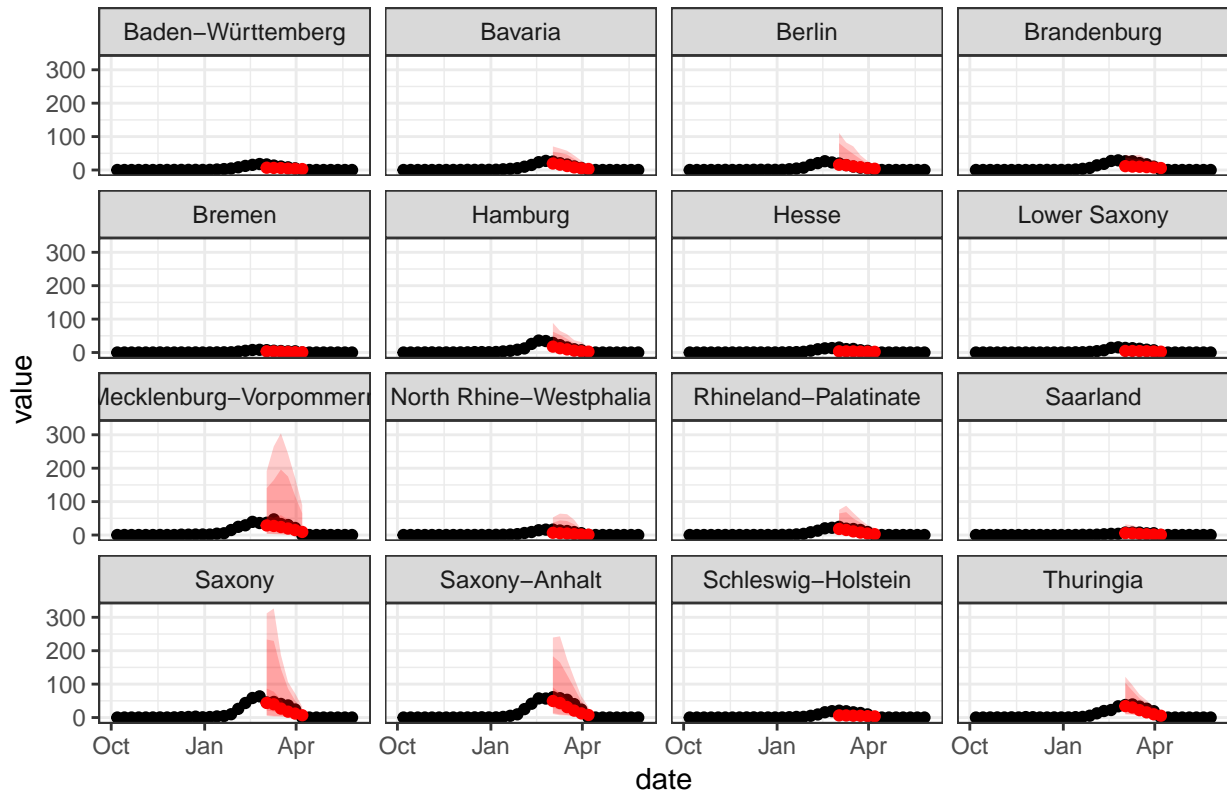
step	DL4EPI	hetGP	SIRS_EAKF	sarimaTD
1	-0.62	-2.69	-4.07	-3.95
2	-2.29	-2.69	-3.99	-4.05
3	-2.52	-2.69	-3.51	-4.13
4	-3.85	-2.68	-2.99	-4.17
5	1.03	-2.69	-2.93	-4.22
6	-0.82	-2.69	-3.28	-4.23

some plots

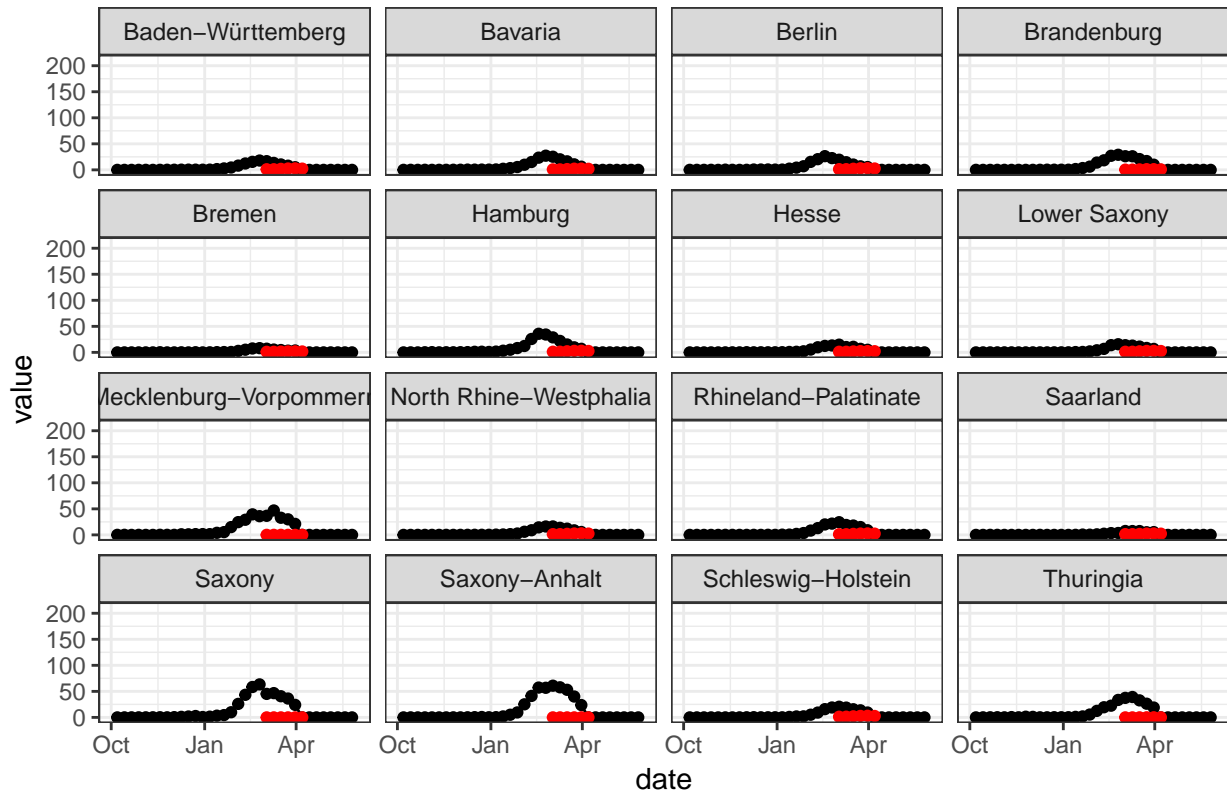
DL4EPI Forecasts from 2019 epiweek 9



hetGP Forecasts from 2019 epiweek 9



SIRS_EAKF Forecasts from 2019 epiweek 9



sarimaTD Forecasts from 2019 epiweek 9

