

Decrease in Tuberculosis Cases during COVID-19 Pandemic as Reflected by Outpatient Pharmacy Data, United States, 2020

Appendix

Supplemental Methods

IQVIA Database Overview

National Prescription Audit (NPA) captures new and refill prescriptions. NPA Extended Insights supplies more granular prescription data. NPA New to Brand (NTB) contains data on the first time a patient uses a brand. NPA Regional provides prescriptions at the state level (all other databases are at the national level). For all NPA databases, the only filter used was to set the Combined Molecule to isoniazid (INH), pyrazinamide (PZA), or “azithromycin.” In the “no filter” analyses, no filters were set. These filters subset the IQVIA data to all prescriptions that contain the identified molecule as the active ingredient. Appendix Table 1 lists the timeframe and metrics used for each module while Appendix Table 2 defines each metric.

The previous modules are at the prescription-level, while Total Patient Tracker (TPT) is at the patient-level. It eliminates duplicate patients and multiple prescription fills to generate a final projected patient count. TPT data start in January 2002, but our analyses started in January 2006 because of the unreliability of data before then. TPT data were generated by creating a study that searched for INH or PZA as the only molecule and then generating a molecule report that excluded prescriptions from veterinarian specialties.

Percent Change Calculation

Percent changes were used for general trends and were calculated as:

$$\frac{\text{number of cases at time}_i - \text{number of cases at time}_{i-1}}{\text{number of cases at time}_{i-1}} * 100$$

where $time_i$ indicates the year or month of interest and $time_{i-1}$ indicates the preceding year or month.

Linear Models

For each drug, we tested 3 different linear models: no other covariates, month as a covariate, and quarter as a covariate. For both INH and PZA, the model with quarter had the best fit (as measured by lowest Akaike Information Criterion (I) and highest R^2), although all models had similar fits (data not shown). We therefore fit a linear model between IQVIA and NTSS data, 2006–2019, with quarter as categorical covariate:

$$IQVIA = \beta_0 + \beta_1 NTSS + \beta_2 quarter + \varepsilon$$

References

1. Aikake H. A new look at the statistical model identification. IEEE Trans Automat Contr. 1974;19:716–23. <https://doi.org/10.1109/TAC.1974.1100705>
2. Hyndman RJ, Athanasopoulos G. Forecasting: principles and practice. Melbourne, Australia: OTexts; 2018 [cited 2021 Jul 27]. <https://otexts.com/fpp2>

Appendix Table 1. Overview of IQVIA prescription modules used to examine decrease in tuberculosis cases during COVID-19 pandemic, United States, 2020*

Module	Earliest prescription data used	Metrics
NPA	February 2015	NRx, RRx, TRx, EUNRx, EURRx, EUTRx
NPA Extended Insights	February 2018	NRx, RRx, TRx, EUNRx, EURRx, EUTRx
NPA NTB	February 2015	NRx, TRx, NBRx, NTS Rx, Cont Rx, Switch Add Rx
NPA Regional	February 2019	NRx, RRx, TRx, EUNRx, EURRx, EUTRx
TPT	January 2006	Projected patient count totals

*Metrics are defined in Appendix Table 2. NPA, National Prescription Audit; NTB, New to Brand; TPT, Total Patient Tracker.

Appendix Table 2. Overview of IQVIA prescription metrics

Metrics	Description
NRx	New prescription counts
RRx	Refill prescription counts
TRx	Total (new plus refill) prescription counts; TRx = NRx + RRx
EUNRx	Number of new dispensed units
EURRx	Number of refill dispensed units
EUTRx	Total number of dispensed units; EUTRx = EUNRx + EURRx
NTS Rx	New therapy start prescription representing patients who have not used any therapy within the USC* market in the last 12 mo
Switch Add Rx	Switch/add prescriptions representing patients who in the past 12 mo have not used the brand previously but has used another drug in the USC* market in that time
NBRx	New to brand prescriptions representing the first-time use of a product within the previous 12 mo; NBRx = NTS Rx + Switch Add Rx
Cont Rx	Continuation on prescription representing repeat customers prescribed who have used the product in the past year

*USC, uniform system of classification, developed by IQVIA to categorize products in same or similar markets.

Appendix Table 3. Correlations between NTSS and IQVIA isoniazid metrics*

Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Month	Case date	No patients with drug resistance in NTSS	TPT	Projected patient count totals	216	0.888
Month	Treatment start date	No patients with drug resistance in NTSS	TPT	Projected patient count totals	216	0.888
Month	Treatment start date	All NTSS counts	TPT	Projected patient count totals	216	0.885
Month	Case date	All NTSS counts	TPT	Projected patient count totals	216	0.854
Quarter	Case date	No patients with drug resistance in NTSS	TPT	Projected patient count totals	168	0.842
Quarter	Treatment start date	No patients with drug resistance in NTSS	TPT	Projected patient count totals	168	0.831
Quarter	Treatment start date	All NTSS counts	TPT	Projected patient count totals	168	0.825
Quarter	Case date	All NTSS counts	TPT	Projected patient count totals	168	0.782
Month	Treatment start date	All NTSS counts	NPA NTB	NBRx	59	0.644
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NBRx	59	0.640
Month	Treatment start date	All NTSS counts	NPA NTB	NTS Rx	59	0.631
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NTS Rx	59	0.630
Month	Case date	All NTSS counts	NPA NTB	NBRx	59	0.625
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	NBRx	59	0.623
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	NTS Rx	59	0.622
Month	Case date	All NTSS counts	NPA Extended Insights	NRx	23	0.621
Month	Case date	All NTSS counts	NPA NTB	NTS Rx	59	0.616
Month	Case date	All NTSS counts	NPA Extended Insights	EUNRx	23	0.610
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	NRx	59	0.595
Month	Case date	No patients with drug resistance in NTSS	NPA	NRx	59	0.584
Month	Case date	No patients with drug resistance in NTSS	NPA	EUNRx	59	0.576
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NRx	59	0.574
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	EUNRx	20	0.566
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	NRx	59	0.563
Month	Treatment start date	All NTSS counts	NPA NTB	NRx	59	0.554
Month	Treatment start date	All NTSS counts	NPA	NRx	59	0.541
Quarter	Treatment start date	All NTSS counts	NPA	EUNRx	20	0.539
Month	Case date	All NTSS counts	NPA Extended Insights	TRx	23	0.538
Month	Case date	All NTSS counts	NPA Extended Insights	EUTRx	23	0.526
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	EUNRx	59	0.518
Quarter	Treatment start date	All NTSS counts	NPA NTB	NTS Rx	20	0.518

Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Quarter	Treatment start date	All NTSS counts	NPA NTB	NBRx	20	0.513
Month	Case date	All NTSS counts	NPA NTB	NRx	59	0.511
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NRx	20	0.509
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NTS Rx	20	0.508
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	NRx	23	0.501
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NBRx	20	0.499
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	NRx	20	0.498
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	NRx	23	0.497
Quarter	Treatment start date	All NTSS counts	NPA NTB	NRx	20	0.496
Month	Treatment start date	All NTSS counts	NPA	EUNRx	59	0.496
Month	Treatment start date	All NTSS counts	NPA Extended Insights	EUNRx	23	0.494
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EUNRx	23	0.494
Month	Case date	All NTSS counts	NPA	NRx	59	0.494
Month	Treatment start date	All NTSS counts	NPA Extended Insights	NRx	23	0.492
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	EUTRx	20	0.489
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EUNRx	23	0.488
Quarter	Treatment start date	All NTSS counts	NPA	NRx	20	0.484
Month	Case date	No patients with drug resistance in NTSS	NPA	EUTRx	59	0.481
Quarter	Case date	No patients with drug resistance in NTSS	NPA	EUNRx	20	0.464
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	TRx	59	0.464
Month	Case date	All NTSS counts	NPA	EUNRx	59	0.462
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	TRx	59	0.460
Month	Case date	No patients with drug resistance in NTSS	NPA	TRx	59	0.459
Quarter	Treatment start date	All NTSS counts	NPA	EUTRx	20	0.458
Quarter	Case date	All NTSS counts	NPA NTB	NTS Rx	20	0.458
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	TRx	59	0.457
Quarter	Case date	All NTSS counts	NPA NTB	NBRx	20	0.450
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	EUTRx	59	0.441
Month	Treatment start date	All NTSS counts	NPA NTB	TRx	59	0.440
Month	Treatment start date	All NTSS counts	NPA	TRx	59	0.435
Quarter	Case date	All NTSS counts	NPA	EUNRx	20	0.434
Month	Case date	All NTSS counts	NPA Extended Insights	RRx	23	0.420
Month	Treatment start date	All NTSS counts	NPA	EUTRx	59	0.415

Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	TRx	23	0.413
Month	Treatment start date	All NTSS counts	NPA Extended Insights	EUTRx	23	0.408
Month	Case date	All NTSS counts	NPA Extended Insights	EURRx	23	0.408
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EUTRx	23	0.407
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	EURRx	20	0.401
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	TRx	23	0.401
Month	Treatment start date	All NTSS counts	NPA Extended Insights	TRx	23	0.400
Quarter	Case date	All NTSS counts	NPA NTB	NRx	20	0.399
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EUTRx	23	0.398
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	TRx	20	0.395
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	TRx	20	0.389
Quarter	Case date	All NTSS counts	NPA	NRx	20	0.383
Month	Case date	All NTSS counts	NPA NTB	TRx	59	0.382
Quarter	Treatment start date	All NTSS counts	NPA	TRx	20	0.377
Month	Case date	All NTSS counts	NPA	TRx	59	0.375
Quarter	Treatment start date	All NTSS counts	NPA NTB	TRx	20	0.373
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	Cont Rx	59	0.372
Month	Case date	No patients with drug resistance in NTSS	NPA	EURRx	59	0.370
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	Cont Rx	59	0.370
Quarter	Treatment start date	All NTSS counts	NPA	EURRx	20	0.369
Quarter	Case date	No patients with drug resistance in NTSS	NPA	EUTRx	20	0.367
Month	Case date	All NTSS counts	NPA	EUTRx	59	0.359
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	NRx	20	0.354
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	RRx	59	0.351
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	EURRx	59	0.349
Quarter	Case date	No patients with drug resistance in NTSS	NPA	NRx	20	0.346
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	NTS Rx	20	0.345
Month	Treatment start date	All NTSS counts	NPA NTB	Cont Rx	59	0.342
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	Cont Rx	20	0.339
Month	Case date	No patients with drug resistance in NTSS	NPA	RRx	59	0.331
Month	Treatment start date	All NTSS counts	NPA	RRx	59	0.325
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	NBRx	20	0.325
Quarter	Case date	All NTSS counts	NPA	EUTRx	20	0.324

Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Month	Treatment start date	All NTSS counts	NPA	EURRx	59	0.321
Quarter	Treatment start date	All NTSS counts	NPA NTB	Cont Rx	20	0.314
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	RRx	23	0.303
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EURRx	23	0.300
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	RRx	20	0.298
Month	Treatment start date	All NTSS counts	NPA Extended Insights	EURRx	23	0.297
Month	Treatment start date	All NTSS counts	NPA Extended Insights	RRx	23	0.283
Quarter	Treatment start date	All NTSS counts	NPA	RRx	20	0.278
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EURRx	23	0.277
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	RRx	23	0.276
Month	Case date	All NTSS counts	NPA NTB	Cont Rx	59	0.275
Quarter	Case date	All NTSS counts	NPA Extended Insights	EUNRx	8	0.267
Quarter	Case date	No patients with drug resistance in NTSS	NPA	EURRx	20	0.265
Quarter	Case date	All NTSS counts	NPA	TRx	20	0.260
Quarter	Case date	All NTSS counts	NPA NTB	TRx	20	0.259
Month	Case date	All NTSS counts	NPA	RRx	59	0.256
Month	Case date	All NTSS counts	NPA	EURRx	59	0.247
Quarter	Case date	No patients with drug resistance in NTSS	NPA	TRx	20	0.216
Quarter	Case date	All NTSS counts	NPA	EURRx	20	0.212
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	TRx	20	0.206
Quarter	Case date	All NTSS counts	NPA NTB	Cont Rx	20	0.190
Quarter	Case date	All NTSS counts	NPA Extended Insights	EUTRx	8	0.186
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	Cont Rx	20	0.162
Quarter	Case date	All NTSS counts	NPA	RRx	20	0.152
Quarter	Case date	All NTSS counts	NPA	NRx	8	0.129
Quarter	Case date	All NTSS counts	Extended Insights NPA	EURRx	8	0.105
Quarter	Case date	No patients with drug resistance in NTSS	Extended Insights NPA	RRx	20	0.105
Quarter	Case date	All NTSS counts	NPA	TRx	8	0.048
Quarter	Treatment start date	All NTSS counts	Extended Insights NPA	EUNRx	8	0.030
Quarter	Case date	No patients with drug resistance in NTSS	Extended Insights NPA	EUNRx	8	0.000

Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EUNRx	8	-0.004
Quarter	Case date	All NTSS counts	NPA Extended Insights	RRx	8	-0.015
Month	Treatment start date	All NTSS counts	NPA NTB	Switch Add Rx	59	-0.038
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	EURx	8	-0.052
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	Switch Add Rx	59	-0.071
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EURx	8	-0.081
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	NRx	8	-0.085
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EURx	8	-0.092
Month	Case date	All NTSS counts	NPA NTB	Switch Add Rx	59	-0.097
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	NRx	8	-0.113
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	EURRx	8	-0.126
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	NRx	8	-0.128
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EURRx	8	-0.149
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	TRx	8	-0.161
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EURRx	8	-0.174
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	TRx	8	-0.180
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	TRx	8	-0.202
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	RRx	8	-0.217
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	Switch Add Rx	59	-0.225
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	RRx	8	-0.229
Quarter	Treatment start date	All NTSS counts	NPA NTB	Switch Add Rx	20	-0.242
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	RRx	8	-0.257
Quarter	Case date	All NTSS counts	NPA NTB	Switch Add Rx	20	-0.274
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	Switch Add Rx	20	-0.296
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	Switch Add Rx	20	-0.435

*IQVIA database and metrics are described in Appendix Tables 1 and 2. NTSS, National Tuberculosis Surveillance System.

Appendix Table 4. Correlations between NTSS and IQVIA pyrazinamide metrics*

Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Quarter	Treatment start date	No patients with drug resistance in NTSS	TPT	Projected Patient Count Totals	168	0.879
Quarter	Treatment start date	All NTSS counts	TPT	Projected Patient Count Totals	168	0.874
Month	Treatment start date	No patients with drug resistance in NTSS	TPT	Projected Patient Count Totals	216	0.858
Month	Treatment start date	All NTSS counts	TPT	Projected Patient Count Totals	216	0.854
Month	Case date	No patients with drug resistance in NTSS	TPT	Projected Patient Count Totals	216	0.852
Quarter	Case date	No patients with drug resistance in NTSS	TPT	Projected Patient Count Totals	168	0.852
Month	Case date	All NTSS counts	TPT	Projected Patient Count Totals	216	0.843
Quarter	Case date	All NTSS counts	TPT	Projected Patient Count Totals	168	0.824
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NBRx	59	0.658
Month	Treatment start date	All NTSS counts	NPA NTB	NBRx	59	0.651
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	NBRx	59	0.605
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NTS Rx	59	0.576
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	NRx	59	0.574
Month	Treatment start date	All NTSS counts	NPA NTB	NTS Rx	59	0.565
Month	Treatment start date	All NTSS counts	NPA	NRx	59	0.559
Month	Treatment start date	All NTSS counts	NPA NTB	NRx	59	0.558
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NRx	59	0.555
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NTS Rx	20	0.549
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	NTS Rx	59	0.545
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NBRx	20	0.544
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	TRx	59	0.520
Month	Case date	No patients with drug resistance in NTSS	NPA	NRx	59	0.518
Month	Case date	All NTSS counts	NPA NTB	NBRx	59	0.517
Quarter	Treatment start date	All NTSS counts	NPA NTB	NTS Rx	20	0.514
Quarter	Treatment start date	All NTSS counts	NPA NTB	NBRx	20	0.512
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	TRx	59	0.502
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	NRx	59	0.502
Month	Treatment start date	All NTSS counts	NPA NTB	TRx	59	0.501
Month	Treatment start date	All NTSS counts	NPA	TRx	59	0.493
Month	Treatment start date	All NTSS counts	NPA Extended Insights	NRx	23	0.485
Month	Case date	No patients with drug resistance in NTSS	NPA	TRx	59	0.481
Month	Case date	All NTSS counts	NPA NTB	NTS Rx	59	0.476
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	TRx	59	0.449

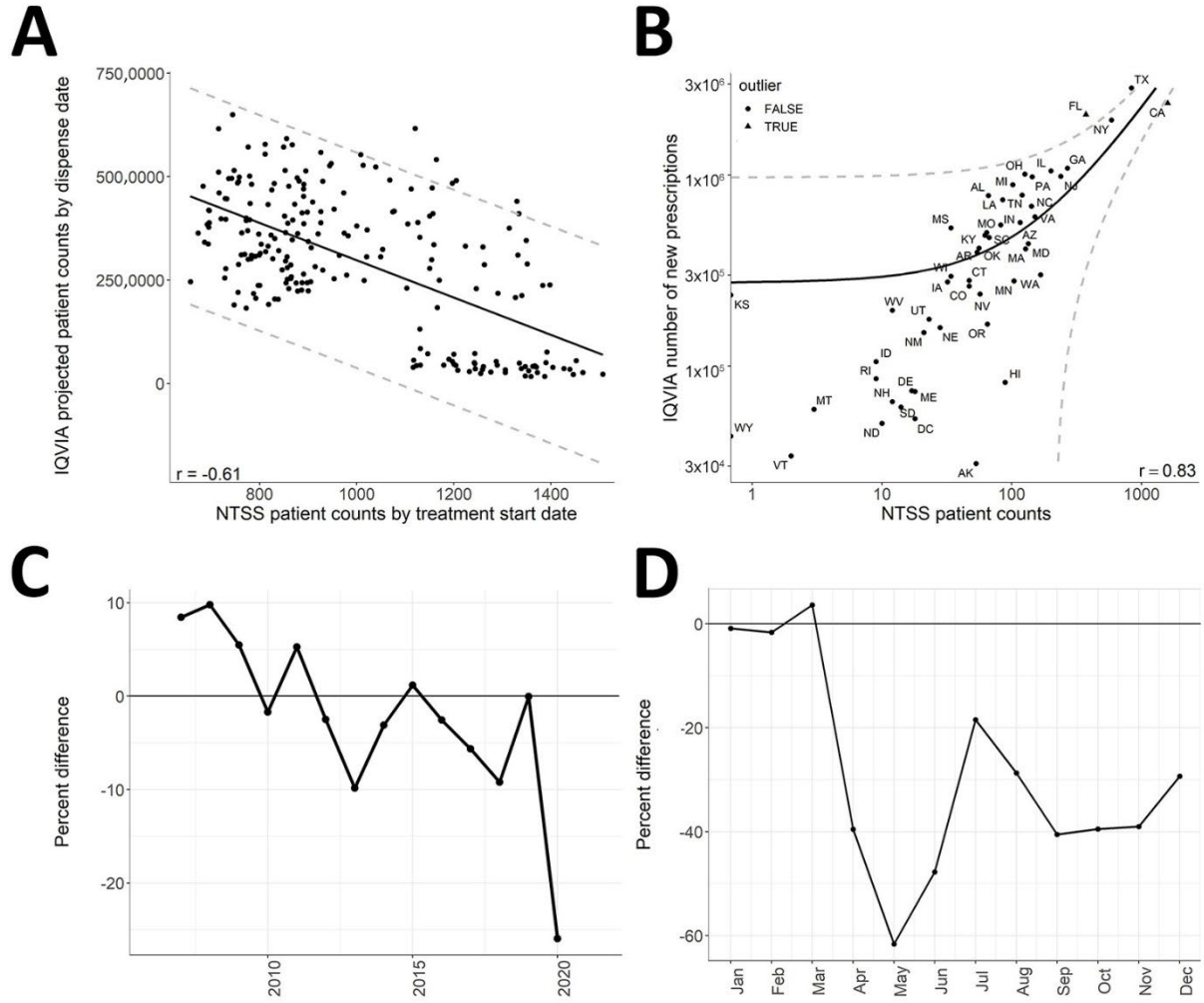
Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Month	Treatment start date	All NTSS counts	NPA Extended Insights	EUNRx	23	0.445
Month	Treatment start date	All NTSS counts	NPA	EUNRx	59	0.431
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	EUNRx	59	0.430
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	NRx	23	0.427
Month	Case date	All NTSS counts	NPA NTB	NRx	59	0.422
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EUNRx	23	0.407
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	Switch Add Rx	59	0.407
Month	Treatment start date	All NTSS counts	NPA NTB	Switch Add Rx	59	0.407
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	Switch Add Rx	20	0.401
Quarter	Case date	All NTSS counts	NPA NTB	NTS Rx	20	0.399
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	NRx	20	0.388
Month	Case date	All NTSS counts	NPA Extended Insights	EUNRx	23	0.382
Quarter	Treatment start date	All NTSS counts	NPA NTB	Switch Add Rx	20	0.380
Month	Case date	All NTSS counts	NPA	NRx	59	0.380
Month	Case date	All NTSS counts	NPA Extended Insights	NRx	23	0.377
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	NTS Rx	20	0.371
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	EUTRx	59	0.370
Month	Case date	No patients with drug resistance in NTSS	NPA	EUNRx	59	0.369
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EUNRx	23	0.360
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	Switch Add Rx	59	0.359
Month	Treatment start date	All NTSS counts	NPA	EUTRx	59	0.356
Quarter	Treatment start date	All NTSS counts	NPA	NRx	20	0.356
Quarter	Case date	All NTSS counts	NPA NTB	NBRx	20	0.342
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	NRx	20	0.340
Month	Treatment start date	All NTSS counts	NPA Extended Insights	TRx	23	0.336
Quarter	Treatment start date	All NTSS counts	NPA NTB	NRx	20	0.331
Month	Case date	No patients with drug resistance in NTSS	NPA	EUTRx	59	0.331
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	NBRx	20	0.329
Month	Case date	All NTSS counts	NPA NTB	TRx	59	0.326
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	TRx	20	0.325
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	NRx	23	0.318
Month	Case date	All NTSS counts	NPA	EUNRx	59	0.305
Month	Case date	All NTSS counts	NPA NTB	Switch Add Rx	59	0.299

Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Month	Case date	All NTSS counts	NPA	TRx	59	0.295
Month	Treatment start date	All NTSS counts	NPA	EUTRx	23	0.292
Month	Treatment start date	No patients with drug resistance in NTSS	Extended Insights NPA	TRx	23	0.291
Month	Case date	No patients with drug resistance in NTSS	Extended Insights NPA	RRx	59	0.282
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	RRx	59	0.281
Quarter	Treatment start date	All NTSS counts	NPA	TRx	20	0.281
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	EUTRx	23	0.267
Quarter	Treatment start date	No patients with drug resistance in NTSS	Extended Insights NPA NTB	TRx	20	0.252
Month	Treatment start date	All NTSS counts	NPA	RRx	59	0.244
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	EUNRx	20	0.236
Quarter	Treatment start date	All NTSS counts	NPA NTB	TRx	20	0.236
Quarter	Treatment start date	All NTSS counts	NPA	EUNRx	20	0.231
Month	Case date	No patients with drug resistance in NTSS	NPA	EUTRx	23	0.219
Quarter	Case date	No patients with drug resistance in NTSS	Extended Insights NPA NTB	Switch Add Rx	20	0.212
Month	Case date	All NTSS counts	NPA	TRx	23	0.212
Quarter	Case date	All NTSS counts	Extended Insights NPA NTB	Switch Add Rx	20	0.209
Month	Case date	All NTSS counts	NPA	EUTRx	59	0.200
Quarter	Case date	All NTSS counts	NPA NTB	NRx	20	0.191
Month	Case date	No patients with drug resistance in NTSS	NPA	TRx	23	0.185
Month	Case date	All NTSS counts	Extended Insights NPA	EUTRx	23	0.185
Quarter	Case date	No patients with drug resistance in NTSS	Extended Insights NPA	NRx	20	0.181
Quarter	Case date	All NTSS counts	NPA	NRx	20	0.173
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	RRx	20	0.172
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	EUTRx	20	0.160
Quarter	Case date	No patients with drug resistance in NTSS	NPA	TRx	20	0.150
Month	Case date	No patients with drug resistance in NTSS	NPA	EURRx	59	0.136
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	NRx	20	0.135
Quarter	Treatment start date	All NTSS counts	NPA	EUTRx	20	0.135
Month	Treatment start date	No patients with drug resistance in NTSS	NPA	EURRx	59	0.121
Quarter	Treatment start date	All NTSS counts	NPA	RRx	20	0.112
Quarter	Case date	All NTSS counts	NPA	EUNRx	20	0.097
Month	Treatment start date	All NTSS counts	NPA	EURRx	59	0.088
Quarter	Case date	All NTSS counts	NPA	TRx	20	0.085
Month	Case date	All NTSS counts	NPA	RRx	59	0.076

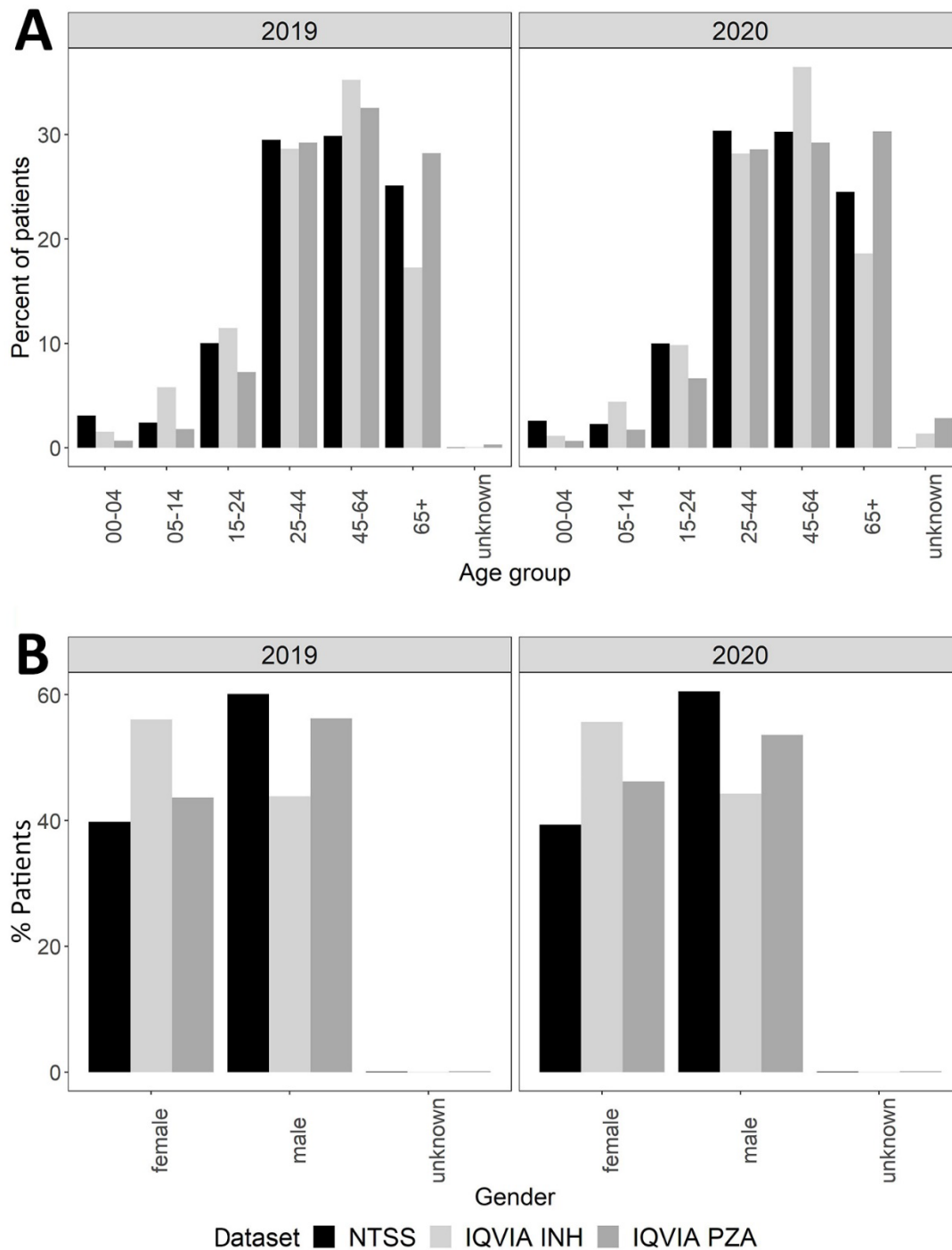
Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Quarter	Case date	No patients with drug resistance in NTSS	NPA	RRx	20	0.076
Quarter	Case date	All NTSS counts	NPA NTB	TRx	20	0.070
Month	Treatment start date	All NTSS counts	NPA NTB	Cont Rx	59	0.064
Month	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	Cont Rx	59	0.060
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	TRx	20	0.055
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	EUNRx	8	0.054
Quarter	Case date	No patients with drug resistance in NTSS	NPA	EUNRx	20	0.040
Month	Case date	No patients with drug resistance in NTSS	NPA NTB	Cont Rx	59	0.036
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EUNRx	8	0.032
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	NRx	8	0.028
Quarter	Case date	All NTSS counts	NPA Extended Insights	EUNRx	8	0.022
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	NRx	8	0.009
Quarter	Case date	All NTSS counts	NPA Extended Insights	NRx	8	0.006
Quarter	Case date	No patients with drug resistance in NTSS	NPA	EUTRx	20	-0.001
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA	EURRx	20	-0.003
Quarter	Case date	All NTSS counts	NPA	EUTRx	20	-0.015
Month	Case date	All NTSS counts	NPA NTB	Cont Rx	59	-0.049
Month	Case date	All NTSS counts	NPA	EURRx	59	-0.059
Quarter	Treatment start date	All NTSS counts	NPA	EURRx	20	-0.061
Quarter	Treatment start date	All NTSS counts	NPA NTB	Cont Rx	20	-0.061
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA NTB	Cont Rx	20	-0.062
Quarter	Case date	No patients with drug resistance in NTSS	NPA	EURRx	20	-0.075
Quarter	Case date	All NTSS counts	NPA	RRx	20	-0.079
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	EUTRx	8	-0.081
Month	Treatment start date	All NTSS counts	NPA Extended Insights	RRx	23	-0.084
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	RRx	23	-0.085
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EUTRx	8	-0.090
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EUNRx	8	-0.091
Month	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EURRx	23	-0.103

Timeframe	NTSS aggregation date	NTSS resistance inclusion	IQVIA database	IQVIA metric	No. timepoints compared	Pearson correlation coefficient
Month	Treatment start date	All NTSS counts	NPA Extended Insights	EURRx	23	-0.113
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	TRx	8	-0.120
Quarter	Case date	All NTSS counts	NPA Extended Insights	EURRx	8	-0.129
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EURRx	23	-0.129
Month	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	RRx	23	-0.130
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	TRx	8	-0.133
Quarter	Case date	All NTSS counts	NPA Extended Insights	TRx	8	-0.144
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	NRx	8	-0.147
Month	Case date	All NTSS counts	NPA Extended Insights	RRx	23	-0.170
Quarter	Case date	All NTSS counts	NPA NTB	Cont Rx	20	-0.183
Quarter	Case date	No patients with drug resistance in NTSS	NPA NTB	Cont Rx	20	-0.196
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EURRx	8	-0.204
Quarter	Case date	All NTSS counts	NPA	EURRx	20	-0.213
Month	Case date	All NTSS counts	NPA Extended Insights	EURRx	23	-0.244
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	TRx	8	-0.281
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	EURRx	8	-0.304
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	EURRx	8	-0.318
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	EURRx	8	-0.387
Quarter	Case date	All NTSS counts	NPA Extended Insights	EURRx	8	-0.388
Quarter	Treatment start date	No patients with drug resistance in NTSS	NPA Extended Insights	RRx	8	-0.388
Quarter	Treatment start date	All NTSS counts	NPA Extended Insights	RRx	8	-0.389
Quarter	Case date	All NTSS counts	NPA Extended Insights	RRx	8	-0.413
Quarter	Case date	No patients with drug resistance in NTSS	NPA Extended Insights	RRx	8	-0.505

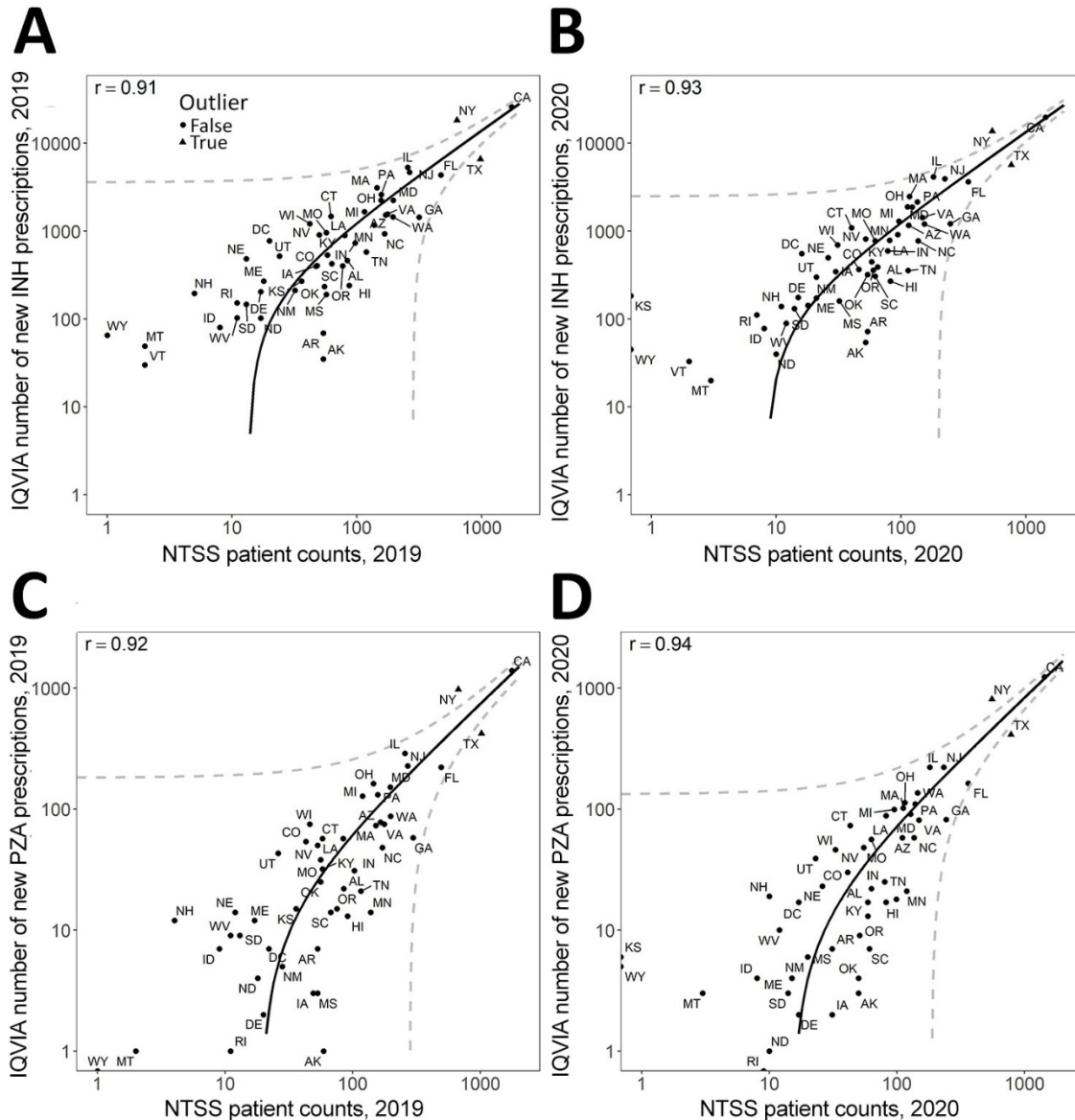
*IQVIA database and metrics are described in Appendix Tables 1 and 2. NTSS, National Tuberculosis Surveillance System.



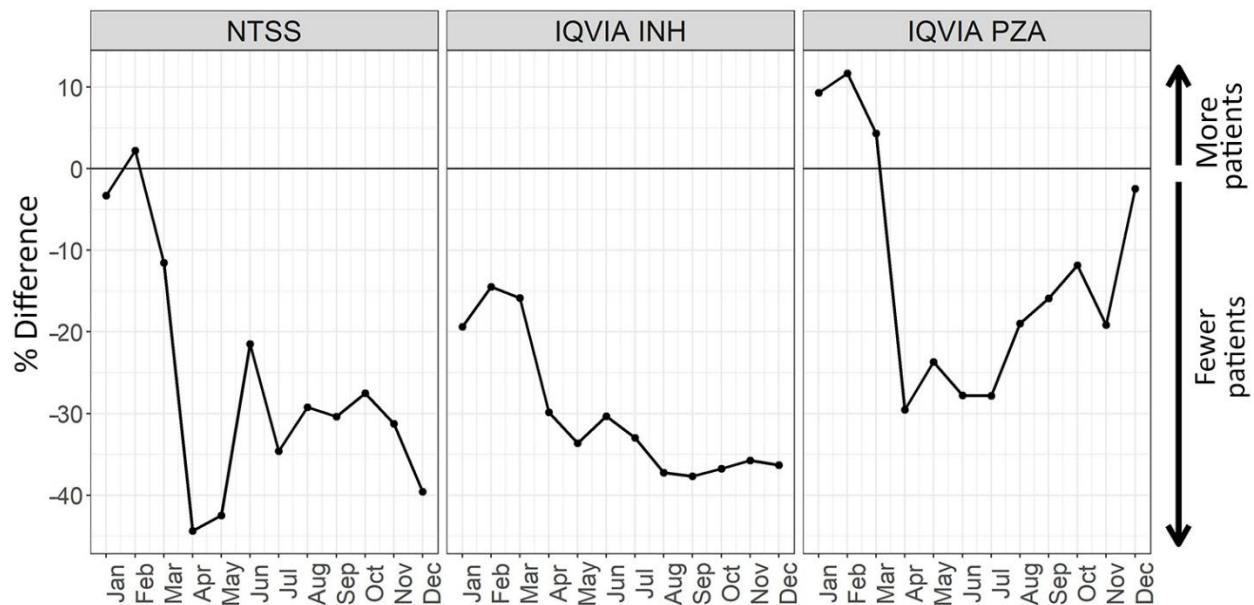
Appendix Figure 1. IQVIA azithromycin projected patient counts compared to NTSS data and changes over time. A) Horizontal axis of each plot is all NTSS patient counts aggregated by treatment start date month, while the vertical axis of each plot is the IQVIA azithromycin projected patient counts. Each point represents a month; all data at the national level during 2006–2019 is shown. B) Each point represents a state indicated by its 2-letter abbreviation. Triangles indicate outliers, defined as states with a standardized residual >3 . Both axes are on a log scale. In panels A and B, the Pearson correlation coefficient (r) is shown in the corner of each plot, the solid black line represents a linear model between the 2 databases, and dashed gray lines indicate the 95% prediction interval. C) Annual percentage change compared to the previous year in IQVIA azithromycin projected patient counts. D) Monthly percent change comparing IQVIA azithromycin projected patient counts each month in 2020 to that month in 2019. NTSS, National Tuberculosis Surveillance System.



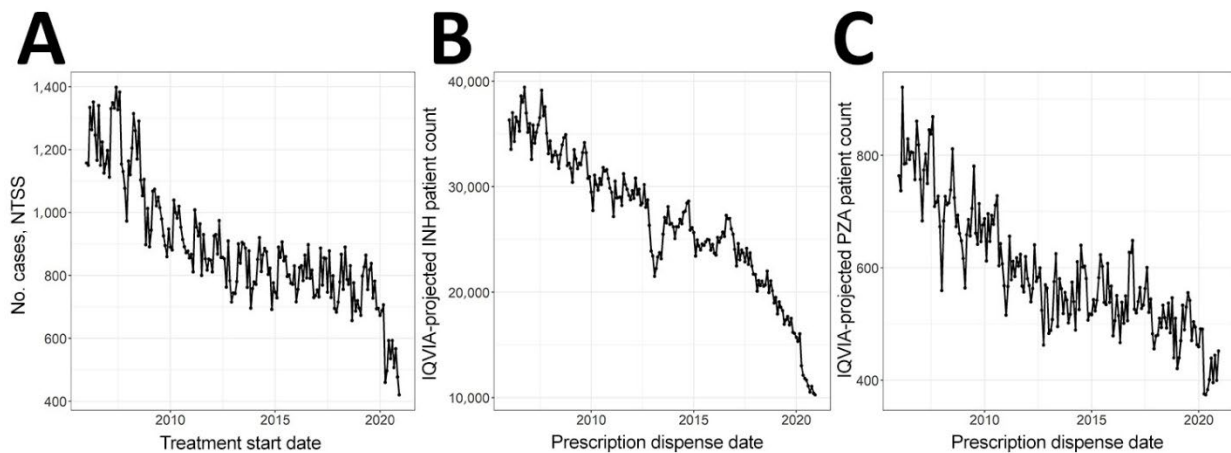
Appendix Figure 2. Comparison of patient demographics between the NTSS and IQVIA. A) Percentage of patients by age group for all NTSS cases (black), IQVIA INH projected patients (light gray), and IQVIA PZA projected patients (dark gray). Left plot shows the distribution in 2019 and right plot shows the distribution in 2020. B) Same as panel A except showing the percentage of patients by sex (NTSS) or gender (IQVIA). INH, isoniazid; NTSS, National Tuberculosis Surveillance System; PZA, pyrazinamide.



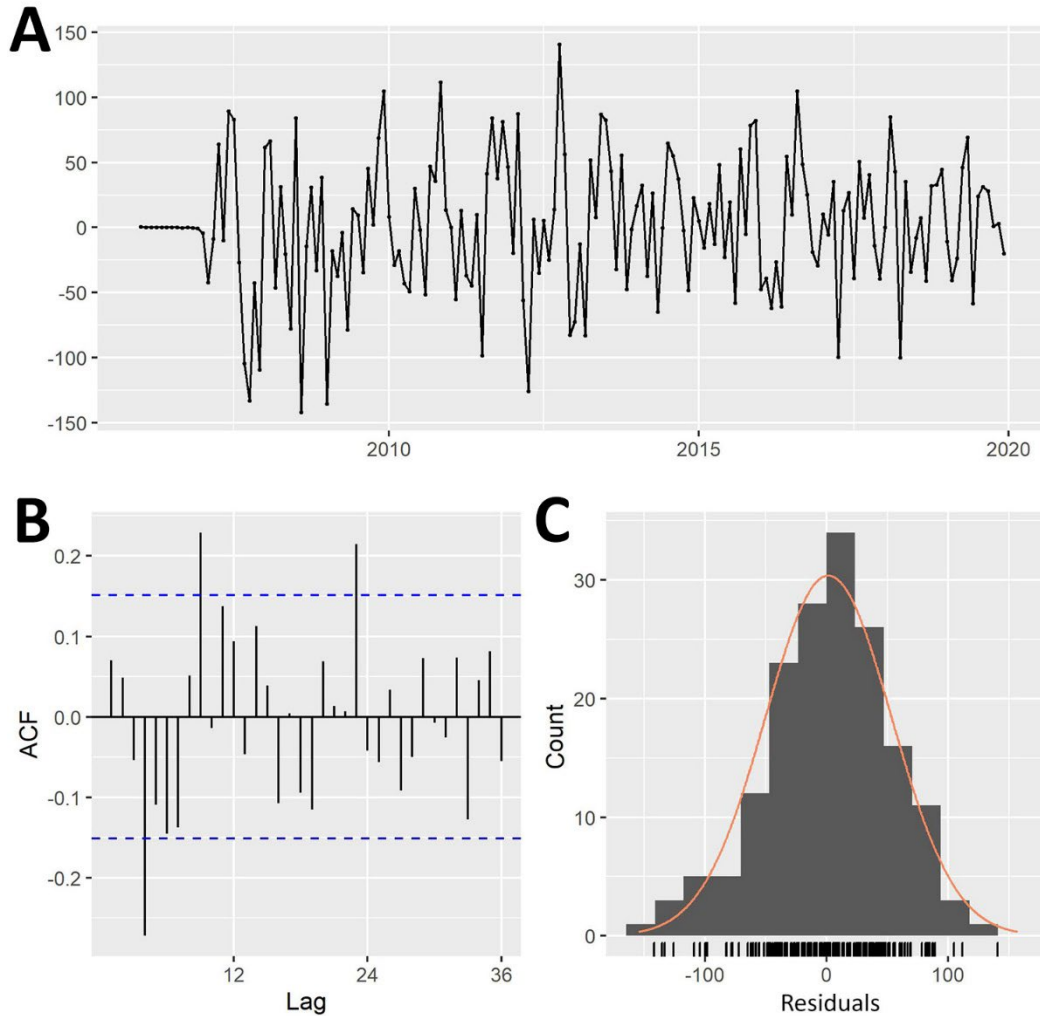
Appendix Figure 3. Comparison between National Tuberculosis Surveillance System (NTSS) and IQVIA data by state. The horizontal axis of each plot is the NTSS patient counts aggregated by treatment start date month and state, removing patients who had reported resistance to isoniazid (A–B) or pyrazinamide (C–D). On the vertical axis of each plot is the isoniazid (A–B) or pyrazinamide (C–D) IQVIA projected patient counts. Both axes are on a log scale. Panels A and C compare 2019 while panels B and D compare 2020 totals. IQVIA data are on different scales and so vertical axes are different. Each point represents a state indicated by its 2-letter abbreviation. Triangles indicate outliers, defined as states with a standardized residual >3 . The Pearson correlation coefficient (r) is shown in the upper left-hand corner of each plot, solid black line represents a linear model between the 2 databases, and dashed gray lines indicate 95% prediction interval.



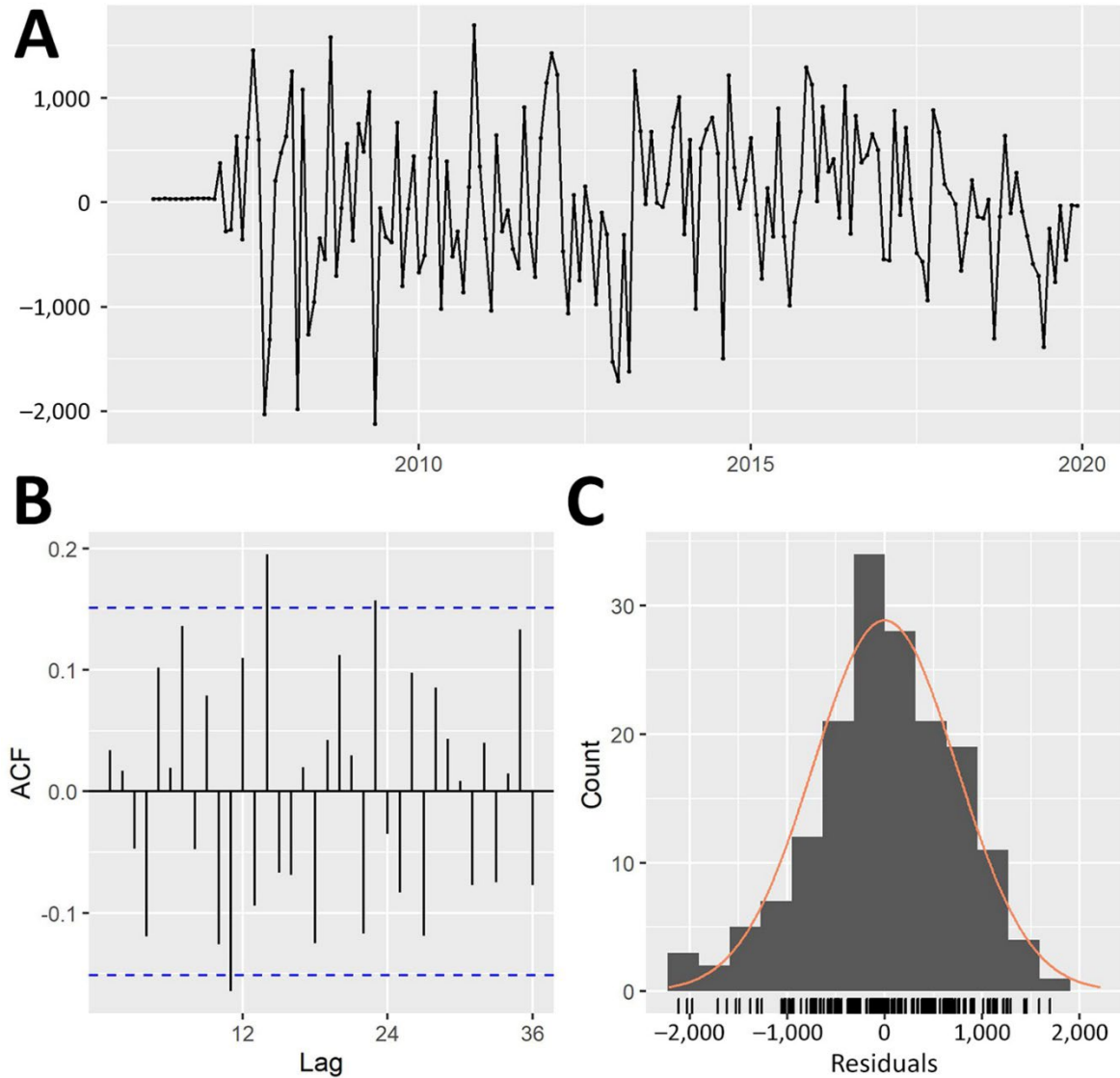
Appendix Figure 4. Percent difference in NTSS case counts and IQVIA projected patient counts between 2019 and 2020 by month. NTSS case counts were aggregated by treatment start date month while IQVIA data were aggregated by projected patient counts for INH or PZA. The horizontal black line represents no change in 2020 compared to 2019, above the line means more prescriptions in 2020, and below indicates less. INH, isoniazid; NTSS, National Tuberculosis Surveillance System; PZA, pyrazinamide.



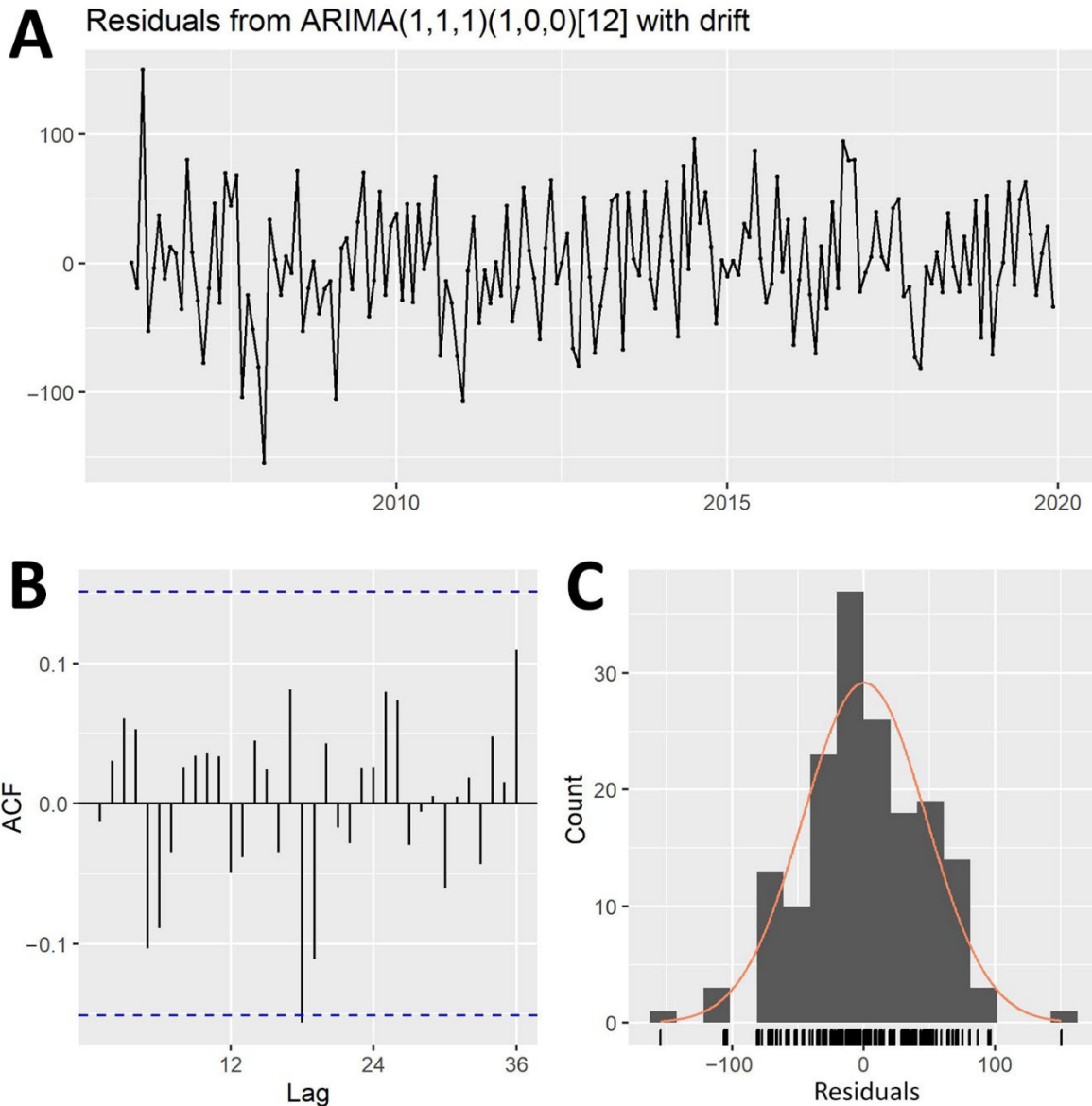
Appendix Figure 5. Database counts over time. Each point represents 1 month for A) NTSS cases aggregated by treatment start date, B) IQVIA INH projected patient counts by prescription dispense date, or C) IQVIA PZA projected patient counts by prescription dispense date. INH, isoniazid; NTSS, National Tuberculosis Surveillance System; PZA, pyrazinamide.



Appendix Figure 6. Residuals for the fitted National Tuberculosis Surveillance System seasonal ARIMA model. The specific model fitted is indicated in the title by ARIMA (p,d,q)(P,D,Q)[s], where (p,d,q) represents the non-seasonal part and (P,D,Q)[s] the seasonal part of the model (2). The number of autoregressive terms in each part are denoted by p and P, the degree of differencing by d and D, and the order of the moving averages by q and Q. The seasonal lag is denoted by s. In this instance, $p = 2$, $d = D = Q = 1$, $q = P = 0$, and $s = 12$ (indicating 12-month lags). ACF, autocorrelation function (represents the coefficients of correlation between a time series and lags of itself). ARIMA, autoregressive integrated moving average.



Appendix Figure 7. Residuals for the fitted IQVIA isoniazid SARIMA model. The specific model fitted is indicated in the title by ARIMA $(p,d,q)(P,D,Q)[s]$, where (p,d,q) represents the non-seasonal part and $(P,D,Q)[s]$ the seasonal part of the model (2). The number of autoregressive terms in each part are denoted by p and P , the degree of differencing by d and D , and the order of the moving averages by q and Q . The seasonal lag is denoted by s . In this instance, $p = 4$, $d = q = P = 0$, $D = Q = 1$, and $s = 12$ (indicating 12-month lags). ACF, autocorrelation function (represents the coefficients of correlation between a time series and lags of itself). ARIMA, autoregressive integrated moving average.



Appendix Figure 8. Residuals for the fitted IQVIA pyrazinamide SARIMA model. The specific model fitted is indicated in the title by ARIMA (p,d,q)(P,D,Q)[s], where (p,d,q) represents the non-seasonal part and (P,D,Q)[s] the seasonal part of the model (2). The number of autoregressive terms in each part are denoted by p and P, the degree of differencing by d and D, and the order of the moving averages by q and Q. The seasonal lag is denoted by s. In this instance, $p = d = q = P = 1$, $D = Q = 0$, and $s = 12$ (indicating 12-month lags). ACF, autocorrelation function (represents the coefficients of correlation between a time series and lags of itself). ARIMA, autoregressive integrated moving average.